SURFACE IMPOUNDMENT CLOSURE
AND POST-CLOSURE PLAN

GMC-FISHER GUIDE DIVISION
SYRACUSE, NEW YORK

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1.0 INTRODUCTION

1.1 FACILITY BACKGROUND

The General Motors Corporation, Fisher Guide Division, Syracuse Plant, is located in Onondaga County, New York, at 1000 Town Line Road in the Town of Salina.

This facility manufactures plastic automotive hardware. Parts made include plastic body and trim components, manufactured by injection molding, painting and assembly.

GMC-Fisher Guide operates its own wastewater treatment facility at the Syracuse Plant. All process wastewater from plant operations is discharged to this facility. Wastewater treatment includes flow equalization, gravity water/solids separation, sediment dewatering by plate and frame filter press, oil emulsion breaking, oil/water separation and reclamation. The effluent from the wastewater treatment operation is discharged to the county wastewater treatment plant and the stormwater outfall is regulated under SPDES Permit NY0000566. No wastes from outside sources are accepted for treatment, storage, or disposal at this facility.

There are two surface impoundments at the GMC-Fisher Guide facility in Syracuse, New York. The impoundments are located north of the manufacturing building, as shown in Figure 1. Impoundment No. 1 measures 235' x 75' and is geometrically irregular. Impoundment No. 2 is 60' x 50' and is oval shaped. Impoundment No. 1 was constructed in 1963 to receive stormwater runoff from paved areas and treated effluent from the wastewater treatment facility. It was designed to retain fluids for removal of coarse solids and to retain free oils. Impoundment No. 2 was constructed in 1979 to collect stormwater and to capture free oil from the stormwater runoff.

The treated influent to the impoundments (primarily Impoundment No. 1) included wastewaters from copper/nickel and chrome plating operations and wastewaters from various painting and plastics forming operations. The sediment was removed from Impoundment No. 1 in the early 1970's. Over the years, as plating processes at the facility were discontinued and wastewater treatment and stormwater facilities were improved, all of the wastewater and the stormwater influent to the impoundments were discontinued. The last of the influents was discontinued as of the fall of 1986. Accumulated direct precipitation is occasionally pumped from the impoundments to the facility wastewater treatment plant.

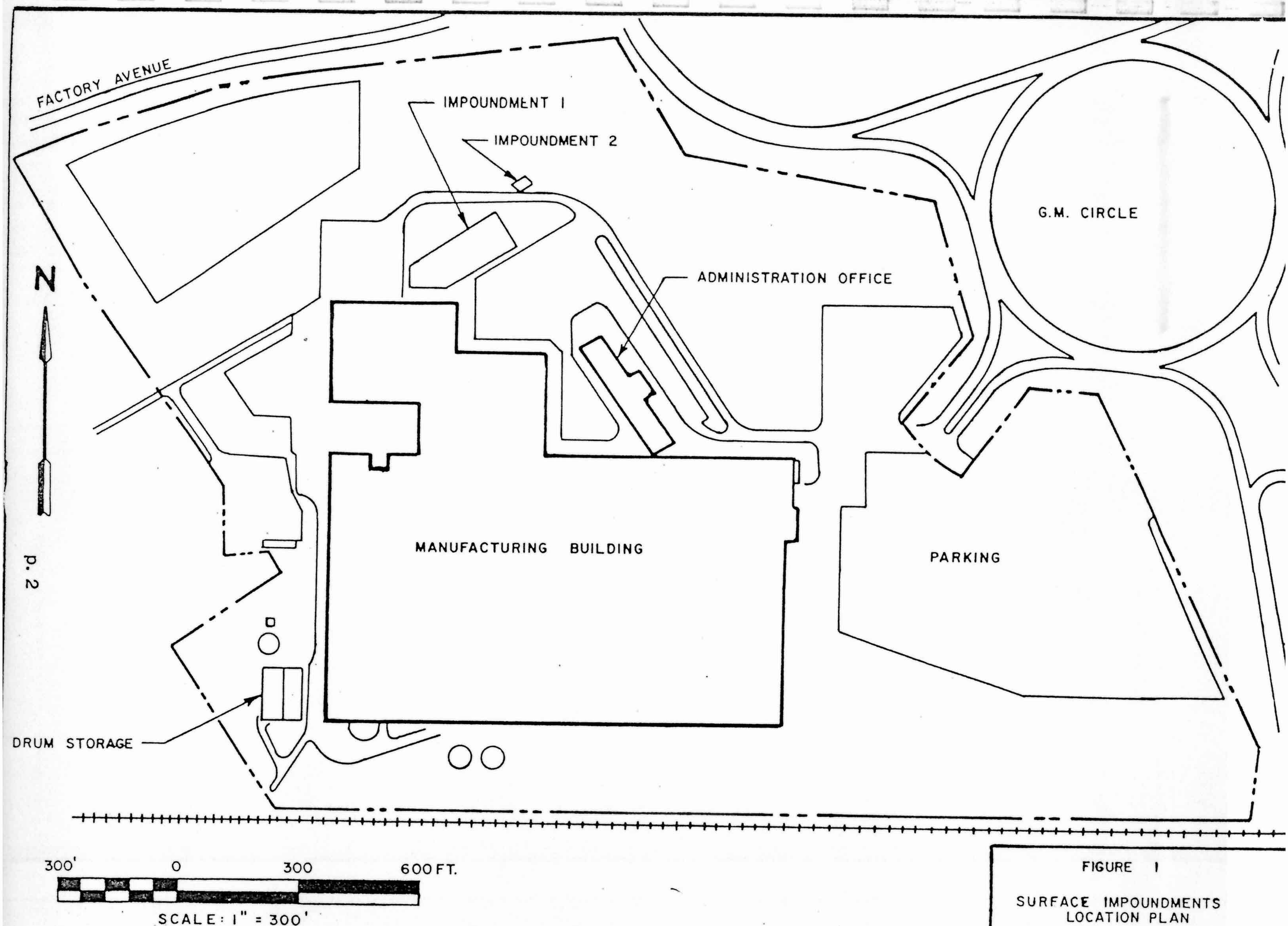


FIGURE 1

SURFACE IMPOUNDMENTS LOCATION PLAN

G.M.C. FISHER GUIDE DIVISION
SYRACUSE, NEW YORK

1.2 PROJECT OBJECTIVES

This closure plan describes each element of the closure sequence and highlights those activities that are necessary to ensure that the surface impoundments are closed in accordance with New York State Department of Environmental Conservation (NYDEC) Standards (6 NYCRR 373-3.7 and 373-3.11).

In addition to attempting to meet the closure performance standard described later in this plan, General Motors Corporation, Fisher Guide Division proposes to resolve public concern related to the presence of minimally contaminated soils at a location known as the Meadowbrook/Hookway Site (Meadowbrook).

These soils contain low levels of polychlorinated biphenyl (PCB) contamination. A complete description of these contaminated soils is included in a report titled "Risk Assessment: Meadowbrook/Hookway, Ley Creek Sediment Deposit Area", September 1987. This report prepared by O'Brien and Gere Engineers, was provided to the New York Department of Environmental Conservation by General Motors Corporation - Fisher Guide Division on October 5, 1987. In summary, that report presented sampling and analytical data which showed that samples from a twelve inch layer of soil/sediment at that site is contaminated with 6.7 parts per million (ppm) of PCB (arithmetic mean of all samples). Below that twelve inch layer, soil samples from the next six inch layer of soil/sediment were found to be contaminated with 0.1 to 0.2 ppm of PCB (calculated geometric mean; included numerous samples less than the detection limit).

Don't mind this info. but please give high value for

Despite the fact that the report concluded that "the site does not presently pose a risk to public health" and under worse case conditions, "does not represent an unacceptable health risk", General Motors Corporation Fisher Guide Division proposes to accept the contaminated soil for final disposition on their property. Specifically, we propose that it be deposited in the excavation to be created by the closure of the impoundments which are the subject of this plan. The Meadowbrook soils and any contaminated impoundment subsoils which can't be removed, would be provided with a clay cover, soil and vegetative cover, surface water management systems, and groundwater monitoring and other appropriate post-closure care and maintenance. (These systems and activities are described in more detail in Sections 2.3.5 and 2.10 of the plan).

Summary of Closure and Closure Design Objectives

In order to meet closure performance standards and minimize risk to human health and the environment, certain objectives have been established for the performance of the closed unit. The objectives are...

- Minimize the infiltration of precipitation,
- Minimize the possibility of groundwater contacting the waste,
- As a result, minimize the production of leachate,
- Minimize the need for post-closure care and maintenance,
- Construct a waste management unit which can be effectively and discretely monitored.

Closure Performance Standard (6 NYCRR 373-3.7(b)

The general approach to closure of both surface impoundments at the GMC-Fisher Guide facility will involve:

- Site preparation,
- Removal/treatment of supernatant,
- Solidification of the impoundment sediments and contaminated soils,
- Removal, transportation and secure landfill disposal of solidified materials,
- Decontamination and removal of existing structures within the impoundment,
- Decommissioning and plugging or reconstruction of existing drainage pipe associated with the impoundments,
- Soil sampling and laboratory analysis to verify sufficient removal of contaminated materials.

And for Impoundment No. 1:

- Backfilling and preparation of placement area,
- Placement of Meadowbrook soils,

- Clay cap and cover placement,
- Final grading for drainage,
- Revegetation,
- Installation of monitoring system.

Concurrent with these activities, additional activities will be conducted to effectively manage stormwater and minimize the potential for contaminant spread during closure operations. These measures will include:

- Construction of temporary flow diversion swales,
- Designation of specific work zones to provide activity controls in the working area.

In this manner, the closure plan has been developed to achieve the state closure performance standard by:

- Minimizing the need for further maintenance, and
- Controlling, minimizing and eliminating, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, and waste decomposition products to the ground, surface waters and the atmosphere.

2.0 CLOSURE PLAN

This section addresses the regulatory requirements related to implementing final closure of the two surface impoundments at the GMC-Fisher Guide facility.

2.1 WASTE INVENTORY

Each of the surface impoundments are constructed as below-grade excavations. Impoundment No. 1 encompasses a surface area of approximately one-half acre. Impoundment No. 2 encompasses a surface area of approximately 2,600 sq. ft. Currently, it is estimated that Impoundment No. 1 contains approximately 1,250 cubic yards of sediment (approximately two feet of sediment) and 325 cubic yards of contaminated soil. Impoundment No. 2 contains approximately 250 cubic yards of sediment and 60 cubic yards of contaminated soil.

GMC-Fisher Guide anticipates that each of the impoundments will at closure contain standing water above the sediment layer. It is estimated that approximately 150,000 gallons of water will require removal and pre-treatment (as described in Section 2.3.2) prior to discharge to the plant's treatment system.

Analytical data for sediments in the impoundments is presented in Appendix A. A review of the data indicates that Impoundment No. 1 contains an average 200 to 300 parts per million (ppm) PCBs. Results from Impoundment No. 2 indicate an average PCB level less than 17 ppm. The two supernatant samples contained 1.9 and 5.5 parts per billion (ppb) of PCBs for Impoundments No. 1 and No. 2, respectively. With the exception of mercury, total metals concentrations were 10 to 100 times greater in Impoundment No. 1 sediment than Impoundment No. 2. The highest metal concentrations in impoundment sediment were chromium (22 to 3,800 mg/kg), iron (4,700 to 15,000 mg/kg), magnesium (1,300 to 11,000 mg/kg), and zinc (91 to 12,000 mg/kg). The results of the EP toxicity, phenols, cyanide, toluene, 1,2-trans-dichloroethylene, xylene, 1,1,1-trichloroethane, and trichloroethylene analyses indicate the sediment material contains only trace amounts of these contaminants. The metals are assumed to be derived from residuals of past metal finishing operations. The low level organic solvent contaminants are assumed to be derived from residuals of painting operations (see section 2.1.1, Site Conditions). The analytical results demonstrate that the EP toxicity levels for metals are below regulatory limits for hazardous classification under state and federal hazardous waste regulations. This indicates the metals of concern are effectively bound in the sediment materials. Additional waste characterization, to be conducted prior to the commencement of closure is described in Appendix C. (Note: Appendix C includes a discussion of sampling for PCB analysis.)

State of New York regulatory requirements for PCB-contaminated wastes require that materials with PCB concentrations exceeding 50 ppm be managed as a hazardous waste. In addition, the State of New York requires that such material be disposed of at a facility in compliance with the Toxic Substance Control Act (TSCA).

Based on the sediment characterization data presented, and regulations enforced under the TSCA (40 CFR 761.75), the solidified material from each impoundment and any excavated soils contaminated with PCB above the closure performance standard will be disposed of at the SCA/Chemical Waste Management landfill facility in Model City, New York. The PCB contaminated waste will be classified as a listed hazardous waste with NYDEC Hazardous Waste Number B007 for

PCB Wastes including contaminated soil, solids, sediments and dredge material (6 NYCRR 371.4 (e) (i)). Excavated soils contaminated with non-PCB hazardous constituents above the closure performance standards will be appropriately classified based on analytical results and disposed of at SCA/CWM. Impoundment supernatant will be pre-treated and transferred to GMC-Fisher Guide's wastewater treatment facility.

same thing

2.1.1 Site Conditions

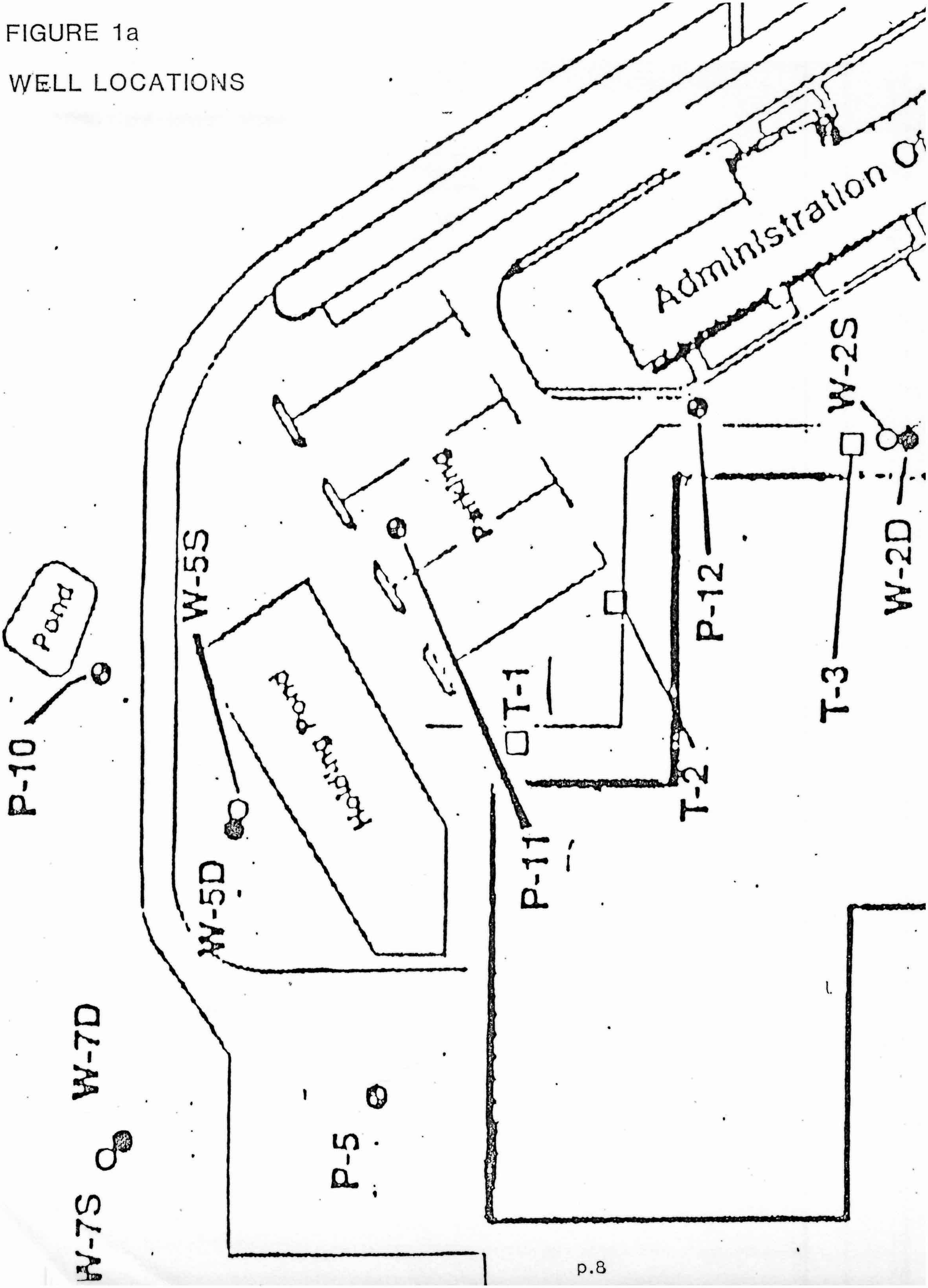
Existing groundwater conditions and subsoil characteristics will effect the design and implementation of this closure and post closure care plan. Available data regarding those items are summarized below.

Subsoil Characteristics - GMC-Fisher Guide retained EDI Engineering and Science (EDI) to conduct a hydro-geological investigation of the Syracuse facility. A final report of that investigation, dated September 1985, has been presented to the New York Department of Environmental Conservation. That investigation included the installation of numerous monitor wells at the facility. Five of these wells were in proximity to the impoundments which are the subject of this closure. Those wells are designated P-5, P-10, P-11, W-5D and W-5S. The location of these wells is shown in Figure 1a. The P-wells were installed in or adjacent to areas associated with storm sewer lines which cross the facility. If, as the soil borings were advanced, the water table was encountered in the backfill, a monitor well was installed. The borings were terminated when either the base of the backfill was reached, or at a maximum depth of 5 feet below the water table. Dry holes were properly abandoned and alternate wells were installed outside but adjacent to the storm sewer backfill in material which would yield water. The soil borings were advanced using 4-1/4 inch I.D. hollow stem augers. Continuous soil samples were obtained with split barrel samplers. The boring logs are included in Appendix B. Monitor wells installed in these borings were constructed using 2 inch diameter stainless steel screens and 2-inch diameter black steel riser pipe.

The W-wells are paired shallow and deep wells. The shallow well was installed to intersect the water table while the deep wells were installed to intersect what appeared to be the most permeable materials encountered within the lacustrine deposits. The W-wells were constructed in a fashion similar to the P-wells. Borings W-5S and W-5D were not continuously sampled.

FIGURE 1a

WELL LOCATIONS



The boring and monitor ing well installation program confirmed that site geology is consistent with published descriptions of regional geology. The site fill material is underlain by lacustrine sediments underlain by glacial till and the Vernon Shale formation. The lacustrine sediments across the site averaged permeabilities of 1.6×10^{-4} cm/sec based on field falling head or rising head permeability tests conducted at thirteen of the deeper wells and based on four laboratory permeability tests. The glacial till across the site appears to be less permeable. Three laboratory permeability tests were conducted on till samples. The till permeability values ranged from 6.0×10^{-8} cm/sec to 2.5×10^{-8} cm/sec. Laboratory permeabilities were determined with a triaxial testing apparatus.

The impoundments were constructed using materials available on the site. The bottom and side walls of the impoundments can be expected to be similar in characteristics to the lacustrine sediments.

The level of chemical contamination, if any, in the underlying soil is unknown. Groundwater sample analytical results for groundwater samples collected from the monitor ing wells in proximity to the impoundments may provide some indication of the level of soil contamination that may exist. These analytical results are summarized below.

Groundwater Conditions - Based on water level elevations taken during the 1985 EDI hydrogeological investigation, a shallow groundwater table elevation map was prepared. This map (Figure 1b) shows that shallow groundwater flows generally to the northeast. EDI noted that this general trend is altered by changes in flow induced by permeable backfill material which is associated with storm sewers which cross the site. In general, shallow groundwater exists at approximately 5 feet below the surface of the site. This means that the soil under the impoundments, if not some of the sediments, are at elevations below the water table.

Samples collected from the five wells in close proximity to the impoundments were analyzed for total metals, VOCs and PCBs. The analytical results for those samples (collected in 1985) are presented in Table 1. Those samples contained low levels (ppb range) of five different VOCs. Trans-1, 2 - dichloroethylene was found in four wells, trichloroethylene in two wells, vinyl chloride in two wells, toluene in one well and methylene chloride in one well. No particular pattern was observed other than the greater frequency at which trans-1, 2 -

TABLE 1

CONTAMINANTS FOUND IN GROUNDWATER SAMPLES IN PROXIMITY TO THE SURFACE IMPOUNDMENTS(1)

		Well Number				
		P-5	P-10	P-11	W-5S	W-5D
Volatile Organic Compounds and Detection Limits	Trans-1,2-Dichloroethylene (.001)	.025	.008 .005	.003	.023	*
	Trichloroethylene (.001)	.005	*	.012	*	*
	Vinyl Chloride (.010)	*	.015	*	.070	*
	Toluene (.001)	*	.006	*	*	*
	1,1 - Dichloroethylene (.001)	*	*	*	*	*
	Chloroform (.001)	*	*	*	*	*
	Miscellaneous VOC's (.001)	*	*	*	*	Methylene Chloride: .04
Total Metals and Detection Limits	Nickel (.02)	*	*	*	*	.05
	Zinc (.02)	*	*	*	*	.06
	Total Chromium (.02)	*	*	*	*	*
	Miscellaneous Metals					
	Antimony (.10)	*	*	*	*	*
	Copper, Lead (.02)	*	*	*	*	*
	Selenium (.002)	*	*	*	*	*
	Arsenic (.002)	*	*	*	*	*
PCB's in ug/l	Total PCB's - Aroclor 1248 (.1 ug/l)	*	*	*	*	*

* Below detection limit

(1) All data (Except PCB's) reported in mg/l.

dichloroethylene appeared. The sample from well W-5D contained low (ppb) levels of nickel and zinc. No PCBs, chromium or copper was detected in samples from any of these five wells.

No sampling or water level measurement has been conducted on these wells since the EDI report was prepared.

2.2 TEMPORARY CONTROL SYSTEMS

2.2.1 Run-on and Runoff Control

During site preparation, surface water diversion berms and swales will be constructed to direct run-on away from the immediate work area. Silt and sediment retention structures may be installed, as necessary, to allow run-off while containing sediments. If Meadowbrook soils are to be stockpiled, appropriate controls would be used to minimize run-on and to control runoff.

These temporary measures to be implemented during closure will effectively prevent contamination of stormwaters during the construction period, minimize soil erosion and maximize sediment control.

2.2.2 Dust and Particulate Control

Site haul roads and work areas will be maintained with a water supply source to minimize release of nuisance dusts. Similarly, moisture control measures will be implemented during solidification and Meadowbrook soil placement operations to minimize airborne particulates generated from these activities.

2.3 SURFACE IMPOUNDMENT CLOSURE OPERATIONS

2.3.1 Overview

GMC-Fisher Guide will utilize Weston Services Incorporated, a qualified contractor, to execute the impoundment closure project. Once mobilization and site preparations are completed, closure operations will begin. Initially, supernatants will be removed and treated on site. Once the impoundment liquids are removed, then solidification/removal operations of the remaining sediments will begin. Contaminated materials will be disposed of in a TSCA-approved, Class I, SCA/Chemical Waste Management landfill located in Model City, New York. Each waste shipment will be properly manifested and transported in vehicles licensed as commercial hazardous waste transporters in the State of New York.

Following removal of all contaminated materials and prior to placement of Meadowbrook soils in Impoundment No. 1, a verification soil sampling and analysis program will be conducted to determine if the closure standard has been met. During this operation, the remaining structures and piping will either be decontaminated or disposed of with the contaminated sediments and soils. Once verification sampling and laboratory analysis is complete, indicating that contaminants have been removed from the impoundments to the levels specified within this plan (see Section 2.4), placement of fill material, Meadowbrook soils, a clay cap and soil cover will begin.

2.3.2 Removal/Treatment of Supernatant

To allow as much natural drying of the sediments as practical before full-scale operations begin, the liquid layer within the impoundments will be pumped to a suitable on-site pretreatment unit, based on water quality encountered during closure operations. The pretreated waters will eventually be discharged at the plant effluent discharge to the Onondaga County POTW, in accordance with Onondaga County effluent standards. The on-site pretreatment unit will consist of portable settling tanks and carbon filtration units provided by the contractor. The facility wastewater treatment plant will be used to process all supernatant waters regardless of the need to pre-treat through the portable unit. The need for treatment through the portable unit will be determined by the PCB concentrations in the water. The GMC-Fisher Guide treatment works includes a carbon treatment unit. The capacity of that system is somewhat limited and that unit may not be available to treat supernatant waters and decontamination waters generated during closure. The need for carbon filtration to meet effluent standards will be dependent on the concentration of PCBs in the water as determined by analytical results of water samples to be collected from the impoundments and analyzed at a local certified laboratory.

The system will consist of portable modular (probably skid mounted) Calgon-type carbon filtration units and portable polypropylene batch tanks or portable frame and flexible membrane tanks. The system will be located in close proximity to the impoundments in a secure area behind the temporary fence. The most likely location is east of Impoundment No 1.

2.3.3 Sediment Solidification

Following removal of the liquid layer, sediments present within the impoundments are anticipated to range in solids content from 15 to 35 percent and contain appreciable free liquids.

In order to provide a material consistency suitable for transport and disposal, a solidification approach utilizing a pozzolanic reagent, will be used to remove free liquids and provide final dewatering of impoundment sediments prior to excavation. The reagent will consist of cement kiln dust or lime kiln dust and perhaps fly ash. The final selection of reagents and admixture ratios will be determined based on bench scale testing of samples to be collected prior to construction. This bench scale testing is described in Appendix C, Preconstruction Activity.

The solidification operation will be accomplished by incorporating reagent into the sediments with standard earth moving equipment, such as a hydraulic backhoe, front-end loader, or other mechanical device. The sediment/reagent mixing operation will take place within the confines of each impoundment. Sufficient reagent will be utilized to hydrate free liquids and provide a waste consistency meeting the requirements for disposal at the SCA/Chemical Waste Management landfill facility. The final product should be similar to slightly damp soil.

Waste shipment sampling and analysis procedures will be resolved via the waste disposal approval process required by SCA/CWM corporate policy and operating permits. This process is currently underway.

2.3.4 Impoundment Structures Dismantling, Decontamination and/or Disposal

Cannot decon wood or concrete

Rigid structures within the impoundments, including concrete and metal dams, wooden sampling platforms and reinforced concrete inlet/outlet piping, will be dismantled as necessary and decontaminated. Decontamination will be accomplished within the confines of or directly adjacent to the impoundments utilizing hand tools and a high pressure washer or steam cleaner. Decontamination of these structures will take place until waste residues and all visibly contaminated materials are removed. Waste residues resulting from this operation will be collected within the impoundment and managed by solidification and disposal, as described in Section 2.3.3. Washwaters generated during decontamination activities will be contained and managed as described in Section 2.3.2.

Residues and contaminated material generated outside the impoundments will not be placed into the impoundments. However, as the contractor "backs out" of the impoundments with dirty equipment, an initial decontamination of the equipment may be performed at a low point within the boundary of the impoundment or along the berm on plastic sheeting.

This procedure is preferable to moving heavily contaminated equipment to an outside decontamination area for initial decontamination and is consistent with standard procedures for this type of closure. Resulting residues would be stabilized and removed from the impoundments and managed with the other wastes generated by closure. Minimal wash-water would be generated due to the use of high pressure and low volume water/steam washers.

Final decontamination would occur at a decontamination area. The proposed decontamination area is identified on Drawing No. 5, Site Layout. A more detailed sketch of the equipment decontamination pad area is shown in Drawing No. 6. Washwater here would be managed separately from solid residues; it would be temporarily stored and analyzed for PCBs, chromium and pH. Washwater analysis would be on a batch basis and be used to confirm decontamination of equipment as well as proper disposition of the washwater.

Standard pipe plugging methods will be utilized to decommission inlet and outlet piping prior to construction of runoff controls or backfilling.

2.3.5 Backfilling, Grading and Landscaping, Impoundment No.2

Many areas of cleaning site + [illegible] takes place

Following verification by laboratory analysis (Section 2.4) that sufficient excavation of sediments and soils has taken place, or until groundwater is encountered, the impoundment will be backfilled utilizing uncontaminated fill soils from an off-site source. The backfilled impoundment and adjacent disturbed areas will be graded to conform to surrounding topography and existing drainage patterns. Final landscaping will consist of placement of a soil layer and vegetative seeding. In this manner, the closed Impoundment No. 2 area will be available for subsequent use. (Note: This section refers to impoundment No. 2.)

2.3.6 Design and Construction of Meadowbrook Placement Area

As stated in Section 1.2, Project Objectives, it is GMC-Fisher Guide's goal to construct a suitable repository for Meadowbrook soils. Although conditions encountered during closure may result in minor design changes, GMC-Fisher Guide believes that the design presented below will meet the project objectives. Several pre-construction activities identified in Appendix C must be completed to confirm the design suitability. The anticipated changes would be minor, for example, elevations and thickness of specific components. If, for example, modeling data or the characteristics of contaminated subsoils should dictate the need for a thicker clay cap, then additional lifts would be placed in the cap in order to improve the performance of the cap. It is also possible that overall placement area performance can be improved if Meadowbrook soils can be compacted to low permeabilities or by using specialized construction techniques. Due to the extremely low level of predictable contamination in subsoils, major design changes during closure are not expected.

The basic design involves backfilling the excavation created by closure in order to receive the Meadowbrook soils such that they can be placed at an elevation above the water table. Then, a clay cap and soil cover would be placed over the Meadowbrook soils. The cap would have a slight crown diverting runoff to drainage swales around the perimeter of the placement area. Runoff would then drain to the existing storm sewer system.

The enclosed drawing entitled "Approximate Existing Conditions, Cross Section" and "Approximate Existing Conditions, Plan View" (Drawings 1 and 2) show the existing impoundment. The assumption is that approximately six inches of contaminated soil will be removed in conjunction with the sediment. Additional soil removal may be difficult regardless of analytical results due to the presence of groundwater. The drawing shows the approximate elevation of the shallow phreatic (groundwater) surface.

The drawing entitled "Approximate Post-Closure Conditions, Cross Section" (Drawing 3) shows two sections of the placement area following construction. The placement area is also shown in a drawing entitled "Approximate Post-Closure Conditions, Plan View" (Drawing 4). Approximate thickness required for each component of the placement area, based on current estimates are:

Backfill - 2 feet
Meadowbrook soil - 2 1/2 feet
Clay Cap - 1 foot
Soil Cover - 1 1/2 to 2 feet

Specify clay is to be 10^{-7} so 1 ft ok?

The clay cap would be constructed of locally available low permeability material. (Assumed permeabilities of recompacted material to be 10^{-6} cm/sec or better.)

It is assumed that Meadowbrook soil will be delivered to the site by others for direct placement in the impoundment area and compaction and grading by the closure contractor. If the stockpiling of Meadowbrook soils is required, the stockpiling would be minimal. The stockpile would be placed in close proximity to the impoundment or within a backfilled portion of Impoundment No. 1. The soils would be stockpiled and managed in such a way as to minimize run-on to the pile, runoff from the pile and to minimize wind dispersal of material in the pile. This will be accomplished with some combination of berms, access controls, plastic sheeting barriers or covers, wetting (for dust control) or inventory controls. The total time for this phase of the project is expected to be two days.

GMC-Fisher Guide understands that the closed Impoundment No. 1 area can be used for other purposes provided that GMC-Fisher Guide satisfies the concerns of NYDEC with respect to potential environmental impact of the proposed project.

2.4 VERIFICATION SOIL SAMPLING AND ANALYSIS PLAN

may need to add Hg

Following excavation operations, a soil sampling and laboratory analysis program will be conducted to verify that sufficient excavation of contaminated sediments and soils has taken place within the boundary of each of the impoundments. The impoundments will be considered sufficiently decontaminated when surface soils of the excavated impoundment are determined by laboratory analysis to contain less than 25 ppm PCB and less than 10 times (10X) drinking water standards for chromium (<0.5 ppm) as analyzed by the Extraction Procedure (EP) Toxicity Test method presented in 40 CFR Part 261, Appendix II. This level of decontamination for PCB's is specified to be consistent with a recently promulgated federal policy related to performance standards for PCB decontamination (2 April 1987, Federal Register) which is attached as Appendix D. GMC-Fisher Guide believes that these indicator parameters are sufficient for determining the adequacy of soil removal. Additional parameters for each sampling point are not necessary for the reasons stated below. At the request of NYDEC, GMC-Fisher Guide will collect three random soil samples from within Impoundment No. 1 and one sample from within Impoundment No. 2 and analyze those samples for Appendix IX constituents. Those samples will be collected to a depth of six inches. If Appendix IX constituents are found, then additional soil sampling on a grid will be conducted to identify the extent of contamination within the impoundments. Soil removal and perhaps design changes will then occur based on the results of the sampling. Excavation into groundwater at this site however, will not be feasible.

<u>Facts Supporting Closure Performance Standards Parameter Selection</u>

- Low level VOC contamination in the area of the impoundments appears to exist (EDI hydrogeological investigation). Low levels of some of the same VOC compounds exist in the sediment (EDI impoundment closure report). Although waste or material management in the impoundments may have been the source of these contaminants, the contaminant levels in the sediment are so low that the sediment should not be considered a "source" since the levels in the sediment are comparable to the levels in the groundwater nearby. Groundwater may saturate the sediment at lower elevations.

o The impoundment closure study included an evaluation of sediments in the impoundments. GMC-Fisher Guide will recharacterize the sediments prior to conducting closure. (See Appendix C)

The following subsections detail the key elements of this sampling and analysis program.

2.4.1 Sampling Methods and Frequency

Sample points will be determined by laying out a grid pattern within the boundary of the impoundment, as shown in Figure 2, yielding twenty samples in Impoundment No. 1 and five samples from Impoundment No. 2. This grid interval was developed utilizing a U.S. EPA-recognized formula for effectively proportioning point data to a given area. Sampling locations have been specified to represent waste containment areas within each impoundment.

Samples will be collected using a hand trowel or hand auger advanced from the surface to a depth of at least four to six inches. All sampling methods and sample handling will be conducted in accordance with protocols presented in U.S. EPA guidance document, SW-846 "Test Methods for Evaluating Solid Wastes" and 40 CFR Part 261, Appendix I. Samples will not be composited. Each sample location will be analyzed for PCB and chromium (EP toxicity).

2.4.2 Laboratory Analysis

A New York state or USEPA certified laboratory will be utilized to perform all analysis associated with this program. Samples will be properly containerized, packaged

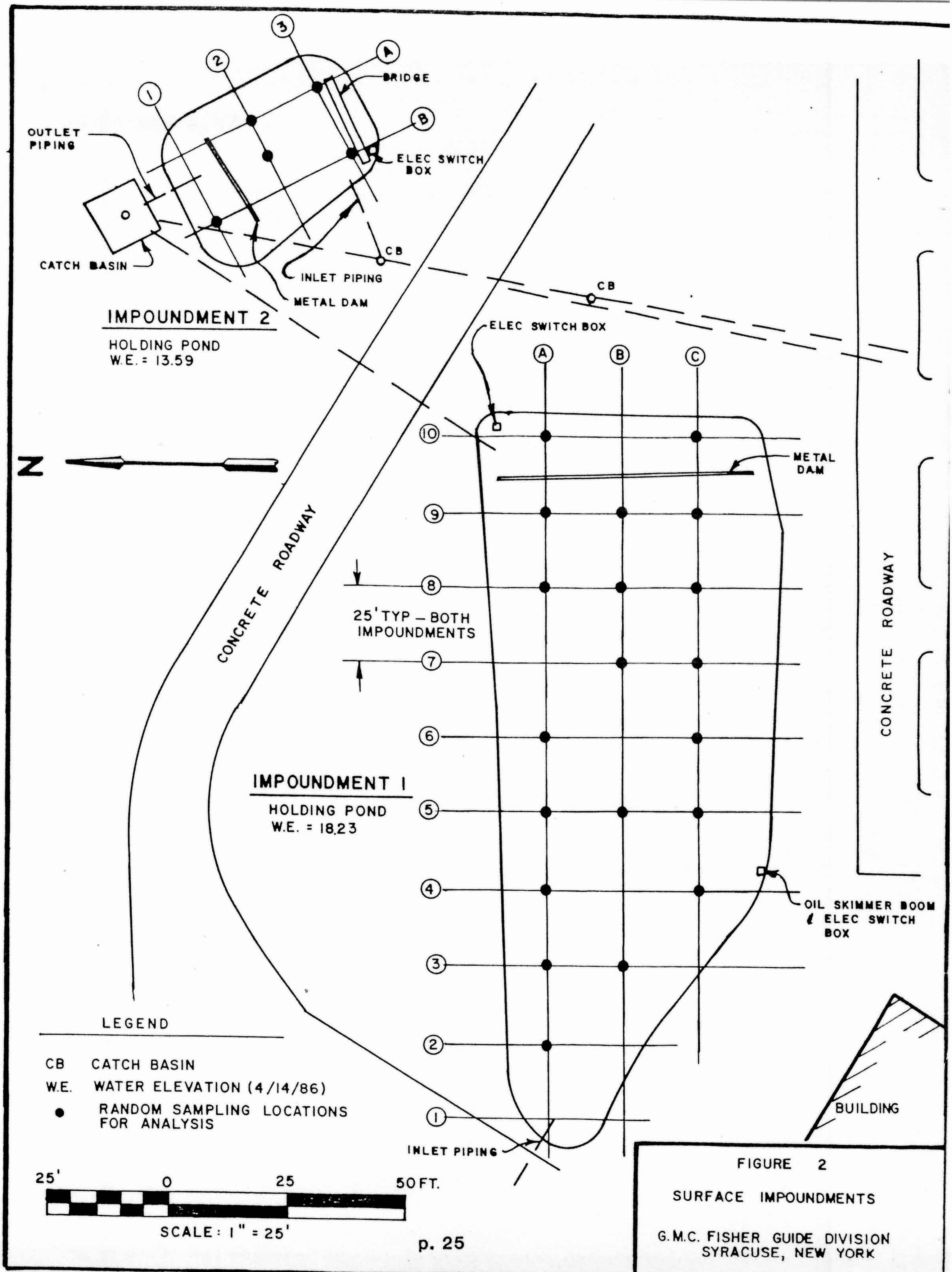


FIGURE 2

SURFACE IMPOUNDMENTS

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and shipped to the lab. The representative samples will be analyzed according to procedures outlined in "Test Methods for Evaluating Solid Wastes - Physical/Chemical Methods," 2nd Edition, U.S. EPA-SW-846 and Extraction Procedure (EP) Toxicity Test (6 NYCRR Part 371, Appendix 20).

Results of the soil sample analyses, as described above, will be utilized to verify that sufficient excavation has taken place within each of the impoundments. In the event above-specified standards for PCB and chromium are exceeded, additional excavation will take place within the area and subsequent resampling and re-analysis will be conducted until the closure performance standard has been achieved or groundwater is encountered.

2.4.3 Quality Assurance/Quality Control

Proper documentation during sampling procedures shall be implemented to collect data for each sample. Entries into the QA logbook will be in standard format and will include, at a minimum, the following information:

- o Site identification
- o Sample locations
- o Sample depth
- o Date
- o Time of collection (24-hour clock)
- o Type of sample container
- o Comments
- o Signature of sampler

All samples will be labeled with the following information:

- o Sample number
- o Site
- o Date/Time
- o Sample location
- o Preservative
- o Signature of sampler

The U.S. EPA chain-of-custody procedures will be followed to ensure preservation of the integrity of all samples. The chain-of-custody record will be initialed at the time of sample bottle preparation and will follow each bottle and lot through the sequence from bottle preparation through completion of laboratory chemical analysis. Appointed field samplers will act as sample custodians and document control officers to monitor the location of collected samples and to record vital sample information in field logbooks.

2.5 PERSONNEL/EQUIPMENT DECONTAMINATION

All personnel, equipment including the portable water treatment system and transportation vehicles leaving the work zone (hot zone) will be decontaminated to prevent off-site migration.

Waste residues generated by decontamination procedures will be removed from the decontamination area sump shown in Drawing No. 6 and managed in the manner described in Section 2.6. Rinsewaters generated will be pre-treated as described in Section 2.3.1.

2.6 WASTE TRANSPORT AND DISPOSAL

2.6.1 Truck Preparation and Loading

The transport vehicles will be lined with polyethylene to reduce the potential for contaminant spread during loading/ unloading operations and transportation. This will also eliminate any lengthy decontamination process.

The material from the impoundments will be transferred from the impoundments directly into the prepared trailer by backhoe or front-end loader.

Upon completion of the loading operations, the field personnel will fold and secure the polyethylene over the load. A secure tarp will be placed over the top of the trailers. The transport vehicle will be decontaminated if necessary, visually inspected for load integrity, and checked for mechanical operating condition before exiting the site.

2.6.2 Hazardous Waste Manifesting System

All wastes removed from the site including spent carbon will be properly manifested and tracked to the SCA/Chemical Waste Management facility in Model City, New York. The hazardous waste manifesting system utilized will comply with 6 NYCRR 372.3.

GMC-Fisher Guide or the designated contractor will ensure that the manifest contains the following information:

- o The manifest document number,
- o The generator's name, mailing address, telephone number and EPA identification number,
- o The name and EPA identification number of each transporter,

- The name, address and EPA identification number of the designated disposal facility, SCA/Chemical Waste Management facility, Model City, New York,

- The waste designation code required by regulations of the DOT,

- The total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle.

The manifest will accompany the shipment of hazardous waste at all times, as required by law.

2.6.3 Transportation/Routing/Scheduling

The transporter will be a licensed hazardous waste transported in the State of New York. As required, the transporter will comply with the U.S. DOT regulations as stated in 49 CFR Parts 171 through 179.

The transportation of waste materials to the SCA/Chemical Waste Management facility will be performed in a manner which will reduce the potential for vehicular accidents and minimize the time that the material is exposed to the environment between loading at the staging areas and the disposal site. All routes shall utilize the interstate highway system or primary federal or state highways.

2.7 HEALTH AND SAFETY

During the course of the impoundment closure activities at the GMC-Fisher Guide facility, safety will command the highest priority. All personnel, visitors and subcontractors will abide by the safety regulations detailed in the Site Safety Plan. In addition to the Site Safety Plan, personnel will receive site-specific job training which will further ensure a safe operation. The Site Safety Plan will be prepared by the closure contractor following closure plan approval and prior to closure.

The potential for migration of contamination will be minimized by delineating zones where prescribed operations occur. Movement of personnel and equipment between zones and into the site will be limited by access control points. By this means, potential contamination will be contained within relatively small areas of the site and its potential for spread reduced. During excavation of sediments and placement of Meadowbrook soils particular attention will be given to the control of particulates. (See Section 2.2.2)

The site will be separated into three zones:

- Exclusion zone
- Contamination reduction zone
- Support zone

The exclusion zone (hot zone) is the contaminated area. All personnel entering this area must wear prescribed levels of protection.

Between the exclusion zone and the support zone is the contamination reduction zone which provides a transition between contaminated and clean zones. This area serves as a buffer to prevent the clean zone from becoming contaminated or affected by other existing hazards. This zone includes both the equipment/transportation vehicles and personnel decontamination zones.

The support zone is the non-contaminated or clean zone.

Since normal work clothing is appropriate within this zone, potentially contaminated personnel clothing will be left in the contamination reduction zone. Contaminated equipment and samples will be left in the exclusion zone until they are decontaminated.

A Weston Services Incorporated employee will serve as site safety officer. The Site Safety Plan must be read and signed by all project personnel. Based on the site safety plan protocols the safety officer will determine the need for particulate sampling or other safety related monitoring.

2.8 CLOSURE CERTIFICATION/AND NOTICES

Within 60 days following closure of the two impoundments GMC-Fisher Guide and an independent registered professional engineer in the State of New York will submit certification statements indicating that the impoundments have been closed in accordance with the specifications of the NYDEC-approved closure plan. GMC-Fisher Guide will also place appropriate notices in the deed and make appropriate notices to local land authorities and provide certified copies of those notices to the NYDEC as required by NYDEC regulations. These notices will include a survey plat and an accurate description of the materials which remain in the placement area as well as appropriate notices as to the fact that the use of the property is restricted under 6NYCRR 373-3.7 and a notice as to required care.

The closure certification report will include a certified set of final design drawings showing "as-built" conditions.

2.9 SCHEDULE FOR CLOSURE

Figure 3 presents the anticipated schedule for closure of the two impoundments at the GMC-Fisher Guide facility. The year of closure will be 1988.

2.10 POST-CLOSURE PLAN

Post closure care for the placement area for the first two months following closure will include weekly inspections of the vegetative cover, cap integrity, runoff control structures, and overall integrity of the area. After this period, these items will be inspected monthly for the first year and quarterly thereafter. Runoff controls and cap integrity will be inspected, as needed, after major precipitation events. All inspections and corrective actions will be documented and maintained in the facility operating record. Benchmarks will be inspected annually. Post closure care will also include general maintenance such as mowing of grass, removal of deep rooted vegetation, control of burrowing animals and the clearing of runoff control structures of accumulated sediments or detritus.

The post-closure care period addressed in this plan is assumed to be five years, which is the same as the period for which post-closure groundwater monitoring is to occur. It is assumed that the need for and extent of post closure care and monitoring beyond the first five years will be established by the post-closure permit.

Appendix E to this closure plan, entitled "Surface Impoundment Post Closure Groundwater Monitoring Plan" prepared by O'Brien & Gere, December 1987, describes the post-closure groundwater monitoring plan.

The facility contact during the post-closure care period will be:

Mr. William E. Kochem Jr.
Senior Plant Engineer
Plant Engineering Department
GMC-Fisher Guide Division
1000 Town Line Road
Syracuse, New York 13221-4869

Within 60 days following completion of the post-closure care period, GMC-Fisher Guide and an independent registered professional engineer will submit certification statements to NYDEC indicating that the impoundments have been closed in accordance with the specifications of the NYDEC-approved post-closure plan.

FIGURE 3

ANTICIPATED CLOSURE SCHEDULE

Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. NYDEC Plan Approval	▲																					
2. Mobilization/Site Preparation			XXX	XXX	XXX																	
3. Treatment/Removal of Impoundment Waste Inventory						XXX	XXX	XXX	XXX													
4. Waste Transport/Disposal								XXX	XXX	XXX												
5. Verification Soil Sampling/Analysis											XXX	XXX										
6. Backfilling, Grading & Landscaping													XXX	XXX	XXX							
7. Closure Certification Submittal to NYDEC																		▲				

3.0 CLOSURE POST CLOSURE COST ESTIMATE/FINANCIAL REQUIREMENTS

It is GMC-Fisher Guide's understanding that the closure and post closure cost estimate is not required as a content item for a closure plan, however is required to be kept at the facility to comply with 6 NYCRR 373-3.8, Financial Requirements. GMC-Fisher Guide has, in the past, complied with these regulations and will continue to comply with these requirements.

A closure/post-closure care cost estimate is included with this plan as Table 2. The estimate provided is the best estimate based on the plan as currently written. Many of the costs are derived from contractor quotes; others are GMC-Fisher Guide's consultant estimates. Following approval of the closure plan GMC-Fisher Guide will finalize the cost estimate and comply with NYDEC financial responsibility regulations.

TABLE 2
SURFACE IMPOUNDMENT CLOSURE/POST-CLOSURE
COST ESTIMATE

Activity/Task	Estimated Cost
Monitoring System Upgrade - Mobilization/installation of 10 wells	$ 25,400
- Survey	1,200
- Field work	8,000
Sediment Characterization/Waste Stabilization/Excavation	74,500
Transportation	125,500
Disposal	326,000
Water Removal & Treatment	20,000
Soil Sampling and Analysis	15,500
Backfill and Grading	42,000
Cap Placement and Grading	55,000
Engineers Inspection, Notice Preparation and Certification	10,000
TOTAL CLOSURE COST ESTIMATE:	$704,000

Activity/Task		Estimated Cost
Annual Post-Closure Groundwater Monitoring		
- Quarterly monitoring for PCB, VHO, BTX, metals	$650/sample 10 wells + 4 QA/QC x 4 quarters	$ 36,400
- Appendix 23 Compliance Monitoring	$4,000/sample 2 wells annually	8,000
- First year accelerated monitoring for PCB, VHO, BTX, metals	$800/sample 2 wells + 2 QA/QC x 4 quarters	12,800
- Sampling, data review and reports	Annual	25,000

TABLE 2 (Continued)
SURFACE IMPOUNDMENT CLOSURE/POST-CLOSURE
COST ESTIMATE

Activity/Task	Estimated Cost
Total First Year Cost [annual cost for subsequent years is $69,400 (less accelerated monitoring)]	$ 82,200
4 years x $69,400	$ 277,600
Subtotal groundwater monitoring	$ 359,800
Annual costs for inspections, mowing, maintenance, etc. 5 years x $5,000	$ 25,000
TOTAL POST-CLOSURE COST ESTIMATE:	$ 384,800

APPENDIX A

ANALYTICAL DATA FOR SURFACE IMPOUNDMENT SEDIMENTS

ANALYTICAL SERVICES
EDI LABORATORY REPORT

CLIENT: FISHER GUIDE DIVISION
PROJECT NO.: 25475
LOCATION: SYRACUSE, NY
SAMPLED BY: MVC & WWB
DESCRIPTION: WASTE CHARACTERIZATION

DATE SAMPLED: 04/23/86 TIME:
DATE RECEIVED: 04/25/86 TIME: 11:00 A
DATE COMPLETED: 05/19/86
SCHEDULED COMPLETION: 5/19/86
ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 66

	S/I 1 Q1-H20	S/I 2 6/5	DETECTION LIMIT	UNIT
EDI SAMPLE NO:	62050	62051		
PCB: AROCLOR 1242	1.9	<1.8	1.8	ug
PCB: AROCLOR 1248	<1.8	5.5	1.8	ug
PCB: AROCLOR 1254	<1.8	<1.8	1.8	ug
PCB: AROCLOR 1260	<1.8	<1.8	1.8	ug

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

CLIENT: FISHER GUIDE DIVISION
PROJECT NO.: 25475
LOCATION: SYRACUSE, NY
SAMPLED BY: MVC & WWB
DESCRIPTION: WASTE CHARACTERIZATION

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DATE COMPLETED: 05/19/86
SCHEDULED COMPLETION: 5/19/86
ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 61

	S/I 2	Q1	Q2	Q3	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62045	62046	62047	62048		
CYANIDE, TOTAL	5.0	5.0	45	35	5.0	mg/kg
PHENOL, TOTAL	<0.10	13	19	17	0.10	mg/kg
PCB: AROCLOR 1242	11	220	210	310	varies	mg/kg
PCB: AROCLOR 1248	<2.0	<20	<20	<20	varies	mg/kg
PCB: AROCLOR 1254	2.0	25	27	42	varies	mg/kg
PCB: AROCLOR 1260	<2.0	3.9	4.1	9.5	varies	mg/kg
TOLUENE	<0.5	<0.5	<0.5	<0.5	0.5	mg/kg
TRICHLOROETHYLENE	4.6	<1.0	<1.0	<1.0	1.0	mg/kg
111-TRICHLOROETHANE	<1.0	<1.0	<1.0	<1.0	1.0	mg/kg
T-1,2 DICHLOROETHENE	2.6	<1.0	<1.0	<1.0	1.0	mg/kg
XYLENE	<0.5	0.8	0.6	1.2	0.5	mg/kg
% SOLIDS	58	46	33	42		%

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

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ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 65

	Q4	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62049		
CYANIDE, TOTAL	17		
PHENOL,TOTAL	13	5.0	mg/kg
PCB: AROCLOR 1242	320	0.10	mg/kg
PCB: AROCLOR 1248	<20	varies	mg/kg
PCB: AROCLOR 1254	29	varies	mg/kg
PCB: AROCLOR 1260	5.4	varies	mg/kg
TOLUENE	<0.5	varies	mg/kg
TRICHLOROETHYLENE	<1.0	0.5	mg/kg
111-TRICHLOROETHANE	<1.0	1.0	mg/kg
T-1,2 DICHLOROETHENE	<1.0	1.0	mg/kg
XYLENE	0.7	1.0	mg/kg
% SOLIDS	49	0.5	mg/kg

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

CLIENT: FISHER GUIDE DIVISION
PROJECT NO.: 25475
LOCATION: SYRACUSE, NY
SAMPLED BY: MVC & WWB
DESCRIPTION: WASTE CHARACTERIZATION

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DATE COMPLETED: 05/19/86
SCHEDULED COMPLETION: 5/19/86
ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 62

	S/I 2	Q1	Q2	Q3	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62045	62046	62047	62048		
ARSENIC, TOTAL	<0.40	<0.40	<0.40	<0.40	0.40	mg/kg
BARIUM, TOTAL	94	110	83	78	2.0	mg/kg
CADMIUM, TOTAL	0.58	2.5	3.1	3.5	0.20	mg/kg
CHROMIUM, TOTAL	22	2,200	2,800	2,300	1.0	mg/kg
COPPER, TOTAL	40	300	300	490	0.20	mg/kg
IRON, TOTAL	4,700	14,000	12,000	15,000	0.20	mg/kg
LEAD, TOTAL	33	260	370	300	1.0	mg/kg
MAGNESIUM	1,300	9,700	11,000	10,000	10	mg/kg
MANGANESE	37	230	180	200	0.20	mg/kg
MERCURY, TOTAL	210	200	240	220	100	ug/kg
NICKEL, TOTAL	16	450	730	810	0.20	mg/kg
SELENIUM, TOTAL	1.2	<0.40	<0.40	<0.40	0.40	mg/kg
SILVER, TOTAL	0.80	1.4	1.6	1.9	0.20	mg/kg
ZINC, TOTAL	91	7,800	12,000	7,500	0.40	mg/kg

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

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ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 63

	Q4	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62049		
ARSENIC,TOTAL	<0.40	0.40	mg/k
BARIUM,TOTAL	160	2.0	mg/k
CADMIUM,TOTAL	1.7	0.20	mg/k
CHROMIUM,TOTAL	2,200	1.0	mg/k
COPPER,TOTAL	450	0.20	mg/k
IRON,TOTAL	9,100	0.20	mg/k
LEAD,TOTAL	190	1.0	mg/k
MAGNESIUM	21,000	10	mg/k
MANGANESE	170	0.20	mg/k
MERCURY,TOTAL	180	100	ug/k
NICKEL,TOTAL	650	0.20	mg/k
SELENIUM,TOTAL	<0.40	0.40	mg/k
SILVER,TOTAL	1.6	0.20	mg/k
ZINC,TOTAL	7,600	0.40	mg/k

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

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PROJECT NO.: 25475
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DESCRIPTION: WASTE CHARACTERIZATION

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SCHEDULED COMPLETION: 5/19/86
ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 60

	S/I 2	Q1	Q2	Q3	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62045	62046	62047	62048		
EP TOXICITY LEACHATE	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
ARSENIC,TOTAL	9.7	<2.0	<2.0	<2.0	2.0	ug/l
BARIUM,TOTAL	0.96	3.8	6.3	7.6	0.10	mg/l
CADMIUM,TOTAL	<0.01	<0.01	<0.01	<0.01	0.01	mg/l
CHROMIUM,TOTAL	<0.01	<0.01	<0.01	<0.01	0.01	mg/l
LEAD,TOTAL	<0.05	<0.05	<0.05	<0.05	0.05	mg/l
MERCURY,TOTAL	0.54	<0.50	0.58	0.50	0.50	ug/l
SELENIUM,TOTAL	<2.0	<2.0	<2.0	<2.0	2.0	ug/l
SILVER,TOTAL	<0.01	0.01	0.01	0.01	0.01	mg/l

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.

ANALYTICAL SERVICES
EDI LABORATORY REPORT

CLIENT: FISHER GUIDE DIVISION
PROJECT NO.: 25475
LOCATION: SYRACUSE, NY
SAMPLED BY: MVC & WWB
DESCRIPTION: WASTE CHARACTERIZATION

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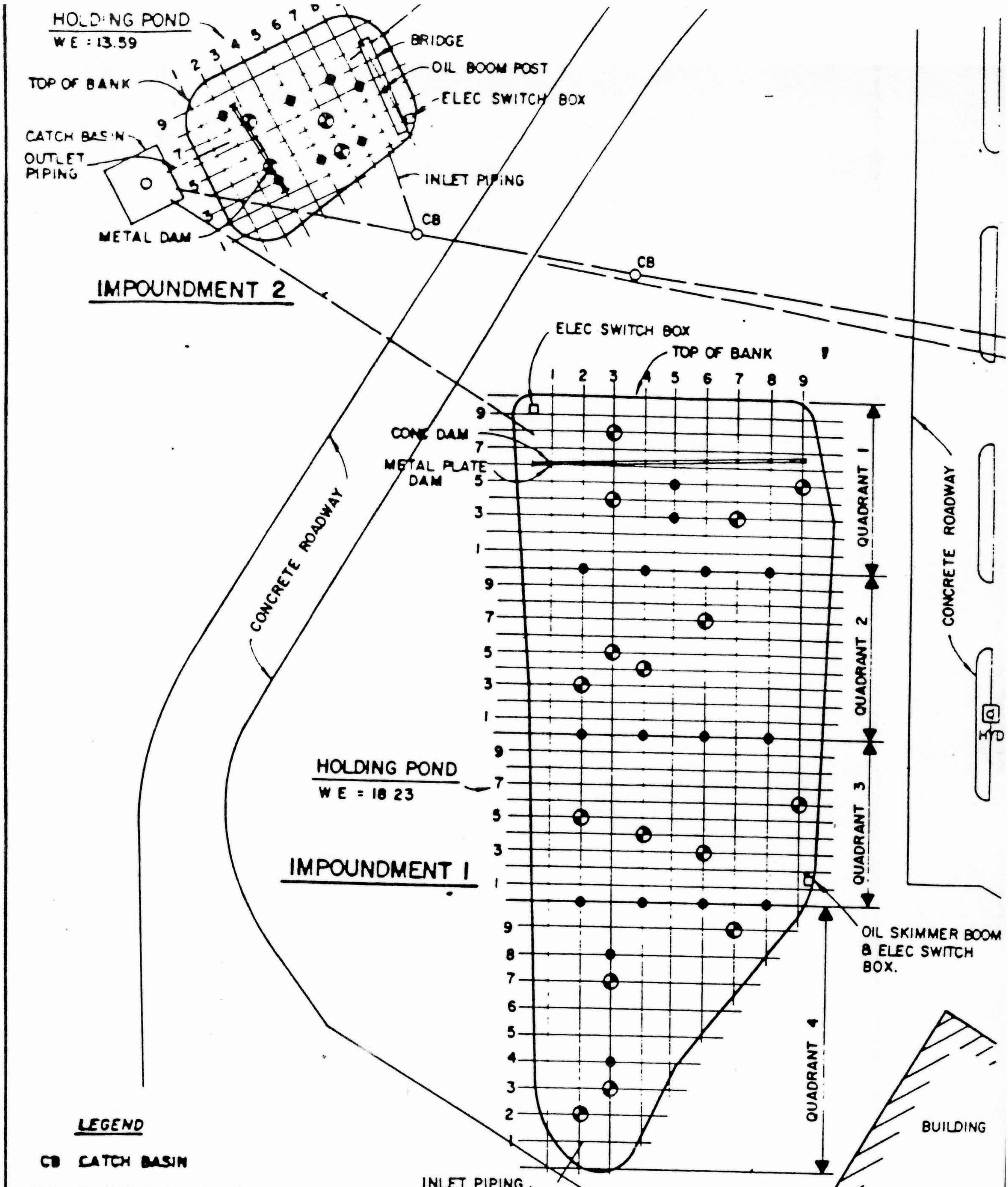
SCHEDULED COMPLETION: 5/19/86
ANALYST: CS,BH,JE,PT,PCC
QUALITY CONTROL REVIEW BY: DEK
WORKSHEET NO: 64

	Q4	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	62049		
EP TOXICITY LEACHATE XXXXXXXXXX			
ARSENIC,TOTAL	<2.0	2.0	ug/
BARIUM,TOTAL	7.2	0.10	mg/
CADMIUM,TOTAL	<0.01	0.01	mg/
CHROMIUM,TOTAL	<0.01	0.01	mg/
LEAD,TOTAL	<0.05	0.05	mg/
MERCURY,TOTAL	0.50	0.50	ug/
SELENIUM,TOTAL	<2.0	2.0	ug/
SILVER,TOTAL	0.01	0.01	mg/

ANALYSIS BY STANDARD METHODS 16TH EDITION AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, USEPA, 1983.



LEGEND

CB CATCH BASIN

W.E. WATER ELEVATION (4/14/86, am)

RANDOM SAMPLING LOCATIONS, FOR ANALYSIS

SLUDGE DEPTH MEASUREMENT LOCATIONS

TRUE NORTH

0 25 50 75

APPROXIMATE SCALE IN FEET

EDI ENGINEERING & SCIENCE

FIGURE 2

SURFACE IMPOUNDMENTS 1 & 2

GMC FISHER GUIDE DIVISION
SYRACUSE, NEW YORK

JUN. 1986

20485

APPENDIX B

SOIL BORING LOGS

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (Inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	Water Level 6-6	Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH	NOTES
0	386.52																9" Concrete
			1		20	29	Gray-Brown fine-coarse SAND & GRAVEL little silt (FILL) (Dry-Firm)										Boring advanced to 13', no free standing water so boring grouted to surface. New boring drilled to 15' with well installed
			2		19	61											
5			3		18	41											
			4		19	20	9.0'										
10			5		20	10	Black Organic SILT, little fine sand (Moist-Loose) 11.0'					9.3					
			6		20	20	Brown fine SAND with layers of silt and clay (Wet-Loose) 12.5'										
			7		22	4	Brown SILT & CLAY, little fine sand, varved (Wet-Soft)										
15							Boring Terminated @ 15.0'										

MONITOR/PIEZOMETER CONSTRUCTION DETAILS

WATER PROBE READINGS

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
5 feet long 13.5' to 8.5'

Riser Pipe
black steel, 2-inch ø
threaded joints with couplings

Backfill Material
4Q size silica sand to 6'
bentonite pellet seal 6' to 4'
cement/bentonite grout 4' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | RQD

Surface Elevation 386.52
Date Started 5-14-85
Date Completed 5-14-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Geologist Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. P-5

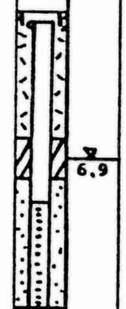
Sheet 1 of 1

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION
0	381.61	/	1	12	38	Gray-Brown fine-coarse SAND, Some Gravel, little silt (FILL) (Dry-Compact) 4.0'
		/	2	9	31	
5		/	3	6	18	Brown-Black SILT, little fine sand, trace gravel (FILL) (Dry-Firm) 8.5'
		/	4	3	22	
		/	5	18	14	Brown-fine SAND, little silt, layers of Silt and fine Sand (Wet-Firm) 10.5'
10		/	6	24	5	Gray-Brown SILT, little clay, partings of fine sand, varved (Wet-Loose)
		/	7	24	7	Brown fine SAND, trace silt (Wet-Loose)
15						Boring Terminated @ 14.0'

UNIFIED SOIL CLASSIF. | DENSITY (PCF) | WATER CONTENT (Percent) | PERMEABILITY (cm/sec)

MONITOR/PIEZOMETER CONSTRUCTION DETAILS

Water Level 6-6



WATER PROBE READINGS: Temp. (°C) | Cond. (µmho/cm) | Eh (mV) | pH

NOTES

First boring hit pipe at 4', drill rig moved 2'.
Second boring drilled to 10', water level below trench base so boring moved to install well.
Third boring drilled and sampled to 14'. Well could not be installed due to running sand.
Fourth boring drilled to 14' without sampling 2' away from third boring and well installed.

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
5 feet long 14' to 9'

Riser Pipe
black steel, 2-inch ø
threaded joints with couplings

Backfill Material
4Q size silica sand to 8'
bentonite pellet seal 8' - 6'
cement/bentonite grout 6' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | RQD

Surface Elevation 381.61
Date Started 5-14-85
Date Completed 5-14-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York

Classified By Geologist Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. P-10

Sheet 1 of 1

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)
0	380.85						1' Concrete				
			1		5	16	Brown fine-coarse SAND, little silt, little gravel (FILL) (Damp-Loose) trace roots and cinders				
			2		8	20	5.0'				
5			3		10	10	Brown-SILT, little clay, occasional embedded coarse Sand, Dark Organic 7.0'				
			4		0	19	SILT (Moist-Loose) 9.0'				
10			5		24	9	Brown-Gray SILT, Some Clay, partings of fine sand, varved (Wet-Loose)				
			6		24						
							Boring Terminated @ 13.0'				
15											

MONITOR/PIEZOMETER CONSTRUCTION DETAILS — Water Level: 6-6: 5.2

WATER PROBE READINGS — Temp. (°C) | Cond. (µmhos/cm) | Eh (mV) | pH

NOTES

1' Concrete
Boring drilled to 8' and well installed. Well dry so well pulled and boring moved 5'. New boring drilled to 13' and well installed.

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
5 feet long 13' to 8'

Riser Pipe
black steel, 2-inch ø
threaded joints with couplings

Backfill Material
40 size silica sand to 7'
bentonite pellet seal 7' - 5'
cement/bentonite grout 5' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | ROD

Surface Elevation 380.85
Date Started 5-23-85
Date Completed 5-23-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Geologist Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. P-11

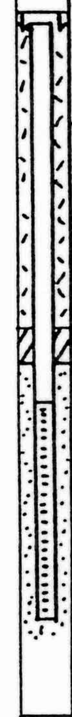
Sheet 1 of 1

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (Inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	NOTES
0	381.52		1		10	26	Brown-gray fine SAND & SILT, Some cinders (Fill) (Dry-Firm)					3" Topsoil
			2		10	10	Brown SILT, Some fine Sand, trace cinders (FILL) (Dry-Firm)					
5			3		0	12	6'					
			4		12	31	Black SILT, Some fine Sand (old Topsoil) 7'					
			5		23	3	Brown fine SAND, little Silt and clay black partings (Moist-Compact) 8'					
10			6		24	5	brown-gray SILT, Some fine Sand, Some Clay, fine sand partings, varved (Wet-Loose)					
			7		24	8	grades to SILT, Some clay, little fine Sand					
15			8		23	3						
			9		24	6	grades to fine SAND, Some Silt, trace clay					
			10		24	2						
20			11		23	3						
			12		24	5					Field 3.6X10^{-4}	
25			13		24	5	26'					
			14		24	6	Red-brown fine SAND, little Silt (Wet-Loose) 28'					
30			15		20	35	Red SILT and fine SAND, Some embedded coarse Sand and fine gravel (TILL) (Wet-Compact)					
			16		14	99	grades to very compact					
							Borings Terminated @ 33'					
35												

MONITOR/PIEZOMETER CONSTRUCTION DETAILS

Water Level

6-6	7-2
5.2	5.3



WATER PROBE READINGS

Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH

NOTES

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
10 feet long, 28.3' to 18.3'

Riser Pipe
blacksteel, 2-inch ø
threaded joints with couplings

Backfill Material
4 Q. Size silica sand 16.5'
bentonite pellet seal 16.5 to 15'
cement/bentonite grout 15' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.	RUN NO.	RECOVERY (Percent)	ROD

Surface Elevation 381.52
Date Started 5-16-85
Date Completed 5-16-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York

Classified By Geologist Checked MR L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. W-5D

Sheet 1 of 1

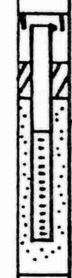
DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (Inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)
0	381.43						Augered to 12.5' with No Samples Taken, See W-5D for Soil Classificatio				
5											
10											
							Boring Terminated @ 12.5'				

MONITOR/PIEZOMETER CONSTRUCTION DETAILS

Water Level

6-6

5.0



WATER PROBE READINGS

Temp. (°C)	Cond. (µmho/cm)	Eh (mV)	pH

NOTES

Dark Soil from 6.5 to 7.5 feet

Well Construction

Well Screen

stainless steel, 2-inch ø
0.01" slot size
5 feet long 10.5' to 5.5'

Riser Pipe

black steel, 2-inch ø
threaded joints with
couplings

Backfill Material

4 Q. size silica sand to 4.0'
bentonite pellet seal 4.0' to 2.2'
cement/bentonite grout 2.2 to surface

Well Completion

locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | RQD

Surface Elevation 381.43
Date Started 5-17-85
Date Completed 5-17-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Driller Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. W-5S

Sheet 1 of 1

APPENDIX C

PRECONSTRUCTION ACTIVITIES

APPENDIX C

PRECONSTRUCTION ACTIVITY

Due to the recent change in the scope of this closure, additional preconstruction activity must be conducted. The majority of this new activity involves confirmation of existing site conditions, determining the characteristics of materials of construction and using that data to confirm the design presented in the most recent draft of the closure post-closure plan. This Appendix describes those new activities as well as some preconstruction activity which would have occurred regardless of recent changes in scope. As pre-construction activities are completed, the data summaries and reports will be appended to this closure plan and presented to NYDEC. As necessary, the closure plan itself will be amended based on new data or the comments of NYDEC.

<u>SEDIMENT RE-CHARACTERIZATION</u> - GMC-Fisher Guide conducted a study of the characteristics of the waste in the impoundments. The report of that study, prepared by EDI Engineering and Science, was presented to NYDEC and some of the data from that report is presented in this closure/post-closure plan. In order to respond to the general concerns of NYDEC regarding waste characteristics in regard to PCB concentrations, GMC will conduct another waste characterization study prior to implementation of closure.

In summary, twenty sediment samples will be collected in Impoundment No. 1 and four samples will be collected in Impoundment No. 2. If at all possible, undisturbed core-type samples will be collected. Field logs will be kept and oil horizons or layers, if encountered, will be documented. Samples will not be composited. If cores can't be retrieved, other representative sampling methods specified in SW-846, "Test Methods for Evaluating Solid Waste", will be utilized. Samples will be analyzed for PCBs. Analytical results will be provided to NYDEC.

Following review of the analytical data, GMC-Fisher Guide will proceed to implement this closure/post-closure plan or to amend the plan as needed, based on the analytical results.

(Note: GMC-Fisher Guide does not acknowledge that the data generated during the EDI study is invalid and GMC-Fisher Guide reserves its rights with respect to this.)

<u>WATER LEVEL MEASUREMENTS</u> - water level measurements will be taken on the five wells in proximity to the surface impoundments (and perhaps other wells) to confirm water table conditions at the facility.

<u>BENCH SCALE SOLIDIFICATION TESTING</u> - Bench scale testing of candidate reagents will be conducted on representative

samples of sediment. The goal of the testing will be to establish QA/QC criteria and admixture ratios for full scale operations. GMC-Fisher Guide and their contractor will evaluate several reagents. We will evaluate initial and final moisture content, solids content, color, unit weight, particle size (as needed) bearing capacity and cure times.

EVALUATION OF CONSTRUCTION MATERIALS - Source materials for the backfill, clay cap and soil cover will be identified and evaluated for their suitability as construction materials. In particular, with respect to the clay cap, we will determine;

- Soil classification,
- Permeability at 95% optimum density
- Atterberg limits (plastic limit, liquid limit, plasticity index),
- Grain size
- Maximum dry density
- Optimum moisture content,
- Organic content

Other materials will be evaluated as appropriate to determine their suitability and to provide data to input to models and formula used to confirm the suitability of design.

EVALUATION OF MEADOWBROOK SOILS - Although not technically considered to be an isolating material, since it is the material being isolated, the characteristics of the Meadowbrook soils are important to determining the water balance of the placement area, thus, Meadowbrook soils will also be evaluated.

DESIGN SUPPORT CALCULATIONS - Based on the data generated above. GMC-Fisher Guide and their contractor will conduct a water balance analysis using a USEPA accepted water balance model such as the HELP model to evaluate the rate at which leachate would be generated from the disposal area and thus cause the further release of contaminants that remain at closure or the release of Meadowbrook soil contaminants. If the water balance models do not sufficiently demonstrate to the NYDEC that further releases are not minimized to the extent necessary to protect human health and the environment, then GMC-Fisher Guide will also evaluate risk based on the USEPA VHS model or some other comparable model as specified by NYDEC.

APPENDIX D

FEDERAL PCB CLEANUP POLICY

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 761

[OPTS 62051; FRL 3179-1]

Polychlorinated Biphenyls Spill Cleanup Policy

AGENCY: Environmental Protection Agency (EPA).

ACTION: TSCA PCB spill cleanup policy rule.

SUMMARY: This rule presents the Toxic Substances Control Act (TSCA) policy for the cleanup of spilled polychlorinated biphenyls (PCBs). The TSCA policy establishes the measures which EPA considers to be adequate cleanup for the majority of situations where PCB contamination occurs during activities regulated under TSCA. While cleanup in accordance with this policy constitutes adequate cleanup of spills within the scope of this policy and creates a presumption against enforcement for penalties or further cleanup, EPA will not exercise enforcement abeyance for a disposal violation if the spill was the result of gross negligence or knowing violation.

Since this rule is a policy statement, it does not require notice and comment under the provisions of the Administrative Procedures Act. However, the Agency welcomes comment on and additional relevant information about the TSCA policy.

DATE: The TSCA policy shall be effective on May 4, 1987.

ADDRESSES: Information or comments for consideration by the Agency should be submitted in triplicate to: TSCA Public Information Office (TS-793), Office of Toxic Substances, Environmental Protection Agency, Rm. G004 NE Mall, 401 M St., SW., Washington, DC 20460.

Information and comments should include the docket number OPTS-62051. Information and comments received in connection with this document will be available for reviewing and copying from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays, in Rm. G004 NE Mall, Environmental Protection Agency, 401 M St., SW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Edward A. Klein, Director, TSCA Assistance Office (TS-799), Office of Toxic Substances, Environmental Protection Agency, Rm. E-543, 401 M St., SW., Washington, DC 20460, (202-554-1404).

SUPPLEMENTARY INFORMATION:

Contents of Preamble

I. Background

EPA regulations controlling the disposal of PCBs, promulgated in the Federal Register of February 17, 1978 (43 FR 7150) and May 31, 1979 (44 FR 31514), broadly define the term "disposal" to encompass accidental as well as intentional releases of PCBs to the environment. Under these regulations, EPA considers intentional, as well as unintentional, spills, leaks and other uncontrolled discharges of PCBs at concentrations of 50 parts per million (ppm) or greater (defined by the concentration of PCBs in the material which spills) to be improper disposal of PCBs. For purposes of this discussion, and as defined in this policy under Unit III, the term "Spill" means spills, leaks, or other uncontrolled discharges of PCBs where the release results in any quantity of PCBs running off or about to run off the surface of the equipment or other PCB source, as well as the contamination resulting from those releases. When PCBs are improperly disposed of as a result of a spill of material containing 50 ppm or greater PCBs, EPA has the authority under section 17 of TSCA to compel persons to take actions to rectify damage or clean up contamination resulting from the spill.

Policies for the cleanup of PCB spills are currently established separately by each EPA regional office, and owners of spilled PCBs are required to meet these standards or face potential penalties under TSCA section 16 for improper disposal of PCBs. Once cleanup occurs to the standard set by the EPA regional offices, the material which has been cleaned, e.g., soil, metal, or equipment, may be processed, distributed in commerce and used (unless the regional office has placed restrictions on these other activities).

EPA standards for the cleanup of spilled PCBs have been established at the EPA regional office level since 1978. Each region sets PCB cleanup standards in the form of general guidelines and then applies the general guidelines on a case-by-case basis for specific spill situations. The general guidelines and their application to spills have differed among regions. For certain spill situations, regions have required cleanup to 50 ppm PCBs. In other spill situations, regions have required cleanup to preexisting background levels or the limit of detection of PCBs.

For PCB spill cleanup, EPA has already in place certain requirements for timely cleanup. In the final PCB Electrical Equipment Rule, published in the Federal Register of August 25, 1982 (47 FR 37342), EPA requires the initiation of PCB Transformer spill cleanup within 48 hours of spill discovery and defines disposal specifically to include leaks, spills, and other unintentional discharges of PCBs. However, the PCB Electrical Equipment Rule did not establish numerical criteria for PCB spill cleanup.

Most recently, the regions have applied the "lowest practicable level" guideline set up in the January 27, 1984, Administrative Law Judge decision on *General Electric* v. *U.S.E.P.A.* The Agency has, however, experienced several areas of difficulty in applying the "lowest practicable level" approach. First, the guideline is subject to, and has resulted in, disparate interpretations. Second, the term "lowest practicable level" cannot be easily applied by the regulated community without guidance from EPA. This can delay cleanup, and delays in cleanup can result in prolonged exposures to humans and more widespread environmental contamination. Finally, the owner of the PCBs may disagree with the EPA regional office's interpretation of the "lowest practicable level" standard. This may occur when the EPA regional office interpretation would require more stringent and costly measures than the owner believes are warranted. This too can delay complete cleanup, as the application of this guideline has, in fact, led to protracted Agency actions in some cases.

Although EPA did not finalize the proposed PCB spill cleanup policy in 1982, EPA has continued to evaluate available information on the risks posed by spilled PCBs and the costs associated with cleanup to various levels. EPA recognized that setting a nationwide TSCA PCB cleanup policy was a desirable goal and in the winter of 1984 EPA produced a draft TSCA Compliance Monitoring Program Policy covering PCB spill cleanup. Although the 1984 draft policy was never officially released, the members of the press and the public acquired and reviewed the draft policy. The Environmental Defense Fund (EDF), Natural Resources Defense Council (NRDC), Edison Electric Institute (EEI), Chemical Manufacturers Association (CMA), and National Electrical Manufacturers Association (NEMA), among others, were principal reviewers of the 1984 draft policy.

On May 17, 1985 EDF, NRDC, EEI, CMA, and NEMA submitted to EPA an alternative PCB spill cleanup policy for consideration by the Agency. EPA viewed the Consensus Agreement as a framework for completing its nationwide TSCA policy and evaluated the Consensus Agreement as a source of information in developing the Agency's own policy. The Agency and the Consensus Group shared two general principles about the appropriate framework for a nationwide PCB spills cleanup policy: That the policy should establish requirements designed to be effective in the large majority of spill situations; and that the risks posed by residual contamination (PCBs remaining after cleanup) vary depending upon the location of the spill and the potential for human exposures.

The requirements and standards in this policy are based upon the Agency's evaluation of the potential routes of exposure and potential risks associated with the more common types of PCB spills, as well as the costs associated with cleanup following these more common types of spills. Typical PCB spills involve the limited release of PCBs during the course of EPA-authorized activities such as: The use of electrical equipment (e.g., transformers and capacitors), the servicing of electrical equipment, and the storage for disposal of PCBs.

In establishing this cleanup policy for typical PCB spills, EPA recognizes that the risks posed by spills of PCBs vary, depending upon spill location and the amount of PCBs spilled. EPA recognized this earlier, in both the August 25, 1982 PCB Electrical Equipment Rule and the July 17, 1985 PCB Transformer Fires Rule. In these rules, EPA placed more stringent requirements on higher concentration PCBs located in areas where their release would pose greatest potential for significant human exposure.

This TSCA policy requires cleanup of PCBs to different levels depending upon spill location, the potential for exposure to residual PCBs remaining after cleanup, the concentration of the PCBs initially spilled (i.e., PCBs spilled from PCB-contaminated equipment versus PCBs spilled from PCB equipment), and the nature and size of the population potentially at risk of exposure. Thus, this policy applies the most stringent requirements for PCB spill cleanup to areas where there is the greater potential for human exposures to spilled PCBs. The policy applies less stringent requirements for cleanup to PCB spills in areas where the type and degree of contact present lower potential exposures. Finally, even less stringent requirements apply to areas where there is little potential for any direct human exposures.

EPA firmly believes that by providing uniform, predictable requirements across the regions for the majority of spill situations, the nationwide policy will reduce the risks posed by spills of PCBs by encouraging rapid and effective cleanup and restoration of the site.

Unit VII of this document discusses available information and the rationale for the policy based upon that information. The policy reflects the Agency's best judgment in light of available information. However, the Agency welcomes comment on, and additional relevant information about, the TSCA policy as the Agency intends to continue to consider comments and evaluate information on the issue of PCB spills cleanup. Should the Agency's evaluation show that new information, or practical considerations associated with the implementation of the policy, warrant changes in, or modifications to, the policy, the policy will be revised accordingly by EPA headquarters. Thus, a public docket has been established to collect comments and information. The Agency believes that much of the data currently lacking can be developed only over a period of time and experience in implementing the policy. Therefore, EPA has not placed a time limit on the submission of comments.

Finally, the Agency intends to re-examine in 12 to 18 months the need to promulgate regulations requiring cleanup in accordance with Agency standards. The Agency's decision on the need to promulgate regulations will be based on two primary considerations. First, EPA will consider whether the issuance of the policy has in fact resulted in the application of consistent nationwide standards to PCB spill cleanup. Second, EPA will consider its experience in enforcing provisions of this policy with particular emphasis on the results of any litigation brought by the Agency for improper PCB disposal from leaks or spills.

II. Scope of the Policy

This policy establishes requirements for the cleanup of spills resulting from the release of materials containing PCBs at concentrations of 50 ppm or greater. The policy applies to spills which occur after the effective date of this policy.

Existing spills (spills which occurred prior to the effective date of this policy) are excluded from the scope of this policy for two reasons: (1) For old spills which have already been discovered, this policy is not intended to require additional cleanup where a party has already cleaned a spill in accordance with requirements imposed by EPA through its regional offices, nor is this policy intended to interfere with ongoing litigation of enforcement actions which bring into issue PCB spills cleanup; and (2) EPA recognizes that old spills which are discovered after the effective date of this policy will require site-by-site evaluation because of the likelihood that the site involves more pervasive PCB contamination than fresh spills and because old spills are generally more difficult to clean up than fresh spills (particularly on porous surfaces such as concrete). Therefore, spills which occurred before the effective date of this policy are to be decontaminated to requirements established at the discretion of EPA, usually through its regional offices.

EPA expects the large majority of PCB spills subject to the TSCA PCB regulations to conform to the typical spill situations considered in developing this policy. However, this policy does exclude from application of the final numerical cleanup standards certain spill situations: Spills directly into surface water, drinking water, sewers, grazing lands, and vegetable gardens. While these spills are subject to the notification requirements and to measures designed to minimize further environmental contamination (see Unit IV.A.), final cleanup standards for these types of spills are to be established at the discretion of the EPA regional offices.

For all other spills, EPA generally expects the final decontamination standards of this policy to apply. Occasionally, some small percentage of spills covered by this policy may warrant different or more stringent cleanup requirements because of additional routes of exposure or significantly greater exposures than those assumed in developing the final cleanup standards of this policy.

There may also be exceptional spill situations that require less stringent cleanup, or a different approach to cleanup, due to factors associated with the particular spill. These factors may mitigate expected exposures and risks or make cleanup to these requirements impracticable.

A. Excluded Spills

Although the following six spill situations are excluded from the automatic application of final numerical decontamination standards of Units IV.B and C, the general requirements under Unit IV.A do apply to these spills. In addition, all of these excluded situations require practicable, immediate actions to contain the area of contamination. While these situations may not always require more stringent cleanup measures, the Agency is excluding these situations because they will always involve significant factors that may not be adequately addressed by cleanup standards based upon typical spill characteristics.

For the following six spill situations, the responsible party shall decontaminate the spill in accordance with site-specific requirements established by the EPA regional offices:

1. Spills that result in the direct contamination of surface waters (surface waters include, but are not limited to, "waters of the United States" as defined in 40 CFR Part 122, ponds, lagoons, wetlands, and storage reservoirs).
2. Spills that result in the direct contamination of sewers or sewage treatment systems.
3. Spills that result in the direct contamination of any private or public drinking water sources or distribution systems.
4. Spills which migrate to and contaminate surface waters, sewers, or drinking water supplies before cleanup has been completed in accordance with this policy.
5. Spills that contaminate animal grazing lands.
6. Spills that contaminate vegetable gardens.

B. Spill Situations Within the Scope of the Policy That May Warrant More Stringent Cleanup Levels

For spills within the scope of this policy, EPA generally retains the authority to require additional cleanup upon finding that, despite good faith efforts by the responsible party, the numerical decontamination levels in the policy have not been met (see discussion in Unit VI). In addition, EPA foresees the possibility of exceptional spill situations in which site-specific risk factors may warrant additional cleanup to more stringent numerical decontamination levels than are required by the policy. In these situations, the Regional Administrator has the authority to require additional cleanup upon finding, based upon the specific facts of the spill, that further cleanup must occur to prevent unreasonable risk. Before making a final decision on additional cleanup, the Regional Administrator will notify the Director of the Office of Toxic Substances of his finding and the basis for the finding.

For example, site-specific characteristics such as short depth to ground water, type of soil, or the presence of a shallow well may pose exceptionally high potential for ground water contamination by PCBs remaining after cleanup to the standards specified in this policy. Spills that pose such a high degree of potential for ground water contamination have not been excluded from the policy under Unit II.A.1 because the presence of such potential may not be readily apparent. EPA feels that automatically excluding such spills from the scope of the policy could result in the delay of cleanup—a particularly undesirable outcome if potential ground water contamination is in fact a significant concern.

C. EPA Flexibility To Allow Less Stringent or Alternative Requirements

EPA retains the flexibility to allow less stringent or alternative decontamination measures based upon site-specific considerations. EPA will exercise this flexibility if the responsible party demonstrates that cleanup to the numerical decontamination levels is clearly unwarranted because of risk-mitigating factors, that compliance with the procedural requirements or numerical standards in the policy is impracticable at a particular site, or that site-specific characteristics make the costs of cleanup prohibitive.

The Regional Administrator will notify the Director of OTS of any decision (and the basis for that decision) to all less stringent cleanup. The purpose of this notification is to enable the Director of OTS to ensure consistency in standards for spill cleanup under special circumstances across the regions.

D. The Relationship of This Policy to Other Statutes

This policy does not affect cleanup standards or requirements for the reporting of spills imposed, or to be imposed, under other Federal Statutory authorities, including but not limited to, the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). Where more than one requirement applies, the stricter standard must be met.

The Agency recognizes that the existence of this policy will inevitably result in attempts to apply the standards to situations within the scope of other statutory authorities. However, other statutes require the Agency to consider different or alternative factors in determining appropriate corrective actions. In addition, the types and magnitudes or exposures associated with sites requiring corrective action under other statutes often involve important differences from those expected of the typical, electrical equipment-type spills considered in developing this policy. Thus, cleanups under other statutes, such as RCRA corrective actions or remedial and emergency response actions under SARA, may result in different outcomes.

III. Definitions

For purposes of this policy, certain words and phrases are used to denote specific materials, procedures, or circumstances. The following definitions are provided for purposes of clarity and are not to be taken as exhaustive lists of situations and materials covered by the policy.

1. *PCBs.* The term means polychlorinated biphenyls as defined in 40 CFR 761.3. As specified in 40 CFR 761.1(b), no requirements may be avoided through dilution of the PCB concentration.
2. *Low-concentration PCBs.* The term means PCBs that are tested and found to contain less than 500 ppm PCBs, or those PCB-containing materials which EPA requires to be assumed to be at concentrations below 500 ppm (i.e., untested mineral oil dielectric fluid).
3. *High-concentration PCBs.* The term means PCBs that contain 500 ppm or greater PCBs, or those materials which EPA requires to be assumed to contain 500 ppm or greater PCBs in the absence of testing.
4. *Spill.* The term as used in this policy means both intentional and

unintentional spills, leaks, and other uncontrolled discharges where the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases. This policy applies to spills of 50 ppm or greater PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled as opposed to the concentration of PCBs in the material onto which the PCBs were spilled. Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm, but less than 500 ppm PCBs, and is subject to the relevant requirements of this policy.

5. *Residential/commercial areas.* Residential/commercial areas are those areas where people live or reside, or where people work in other than manufacturing or farming industries. Residential areas include housing and the property on which housing is located, as well as playgrounds, roadways, sidewalks, parks and other similar areas within a residential community. Commercial areas are typically accessible to both members of the general public and employees and include public assembly properties, institutional properties, stores, office buildings, and transportation centers.

6. *Outdoor electrical substations.* Outdoor electrical substations are outdoor, fenced-off, and restricted access areas used in the transmission and/or distribution of electrical power. Outdoor electrical substations restrict public access by being fenced or walled off as defined at 40 CFR 761.30(1)(1)(ii). For purposes of this TSCA Policy, outdoor electrical substations are defined as being located at least 0.1 kilometer (km) from a residential/commercial area. Outdoor fenced-off and restricted access areas used in the transmission and/or distribution of electrical power which are located less than 0.1 km from a residential/commercial area are considered to be residential/commercial areas.

7. *Other restricted access (nonsubstation) locations.* Other restricted access (nonsubstation) locations are areas other than electrical substations that are at least 0.1 km from a residential/commercial area and limited by man-made barriers (e.g., fences and walls) or substantially limited by naturally occurring barriers such as mountains, cliffs, or rough terrain. These areas generally include industrial facilities and extremely remote rural locations. (Areas where access is restricted but are less than 0.1 km from a residential/commercial area are considered to be residential/commercial areas.)

8. *Nonrestricted access areas.* A nonrestricted access area is any area other than restricted access, outdoor electrical substations, and other restricted access locations, as defined in paragraphs 5 and 6 of this unit. In addition to residential/commercial areas, these areas include unrestricted access rural areas (areas of low-density development and population where access is uncontrolled by either man-made barriers or naturally occurring barriers, such as rough terrain, mountains, or cliffs).

9. *High-contact residential/commercial surface.* A high-contact residential/commercial surface is a surface in a residential/commercial area which is repeatedly touched, often for relatively long periods of time. Doors, wall areas below 6 feet in height, uncovered flooring, windowsills, fencing, banisters, stairs, automobiles, and children's play areas, such as outdoor patios and sidewalks, are examples of high-contact residential/commercial surfaces. Examples of low-contact residential/commercial surfaces include interior ceilings, interior wall areas above 6 feet in height, roofs, asphalt roadways, concrete roadways, wooden utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components (e.g., aluminum/vinyl siding, cinder block, asphalt tiles), and pipes.

10. *High-contact industrial surface.* A high-contact industrial surface is a surface in an industrial setting which is repeatedly touched, often for relatively long periods of time. Manned machinery and control panels are examples of high-contact industrial surfaces. High-contact industrial surfaces are generally of impervious solid material. Examples of low-contact industrial surfaces include ceilings, walls, floors, roofs, roadways and sidewalks in the industrial area, utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components, indoor vaults, and pipes.

11. *Soil.* The term means all vegetation, soils and other ground media, including but not limited to sand, grass, gravel, and oyster shells. It does not include concrete and asphalt.

12. *Impervious solid surfaces.* The term means solid surfaces which are nonporous and thus unlikely to absorb spilled PCBs within the short period of time required for cleanup of spills under this policy. Impervious solid surfaces include, but are not limited to, metals, glass, aluminum siding, and enameled or laminated surfaces.

13. *Nonimpervious solid surfaces.* The term means solid surfaces which are porous and are more likely to absorb spilled PCBs prior to completion of the cleanup requirements prescribed in this policy. Nonimpervious solid surfaces include, but are not limited to, wood, concrete, asphalt, and plasterboard.

14. *Double wash/rinse.* The double wash/rinse procedural performance standard applied in this policy means a minimum requirement to cleanse solid surfaces (both impervious and non-impervious) two times with an appropriate solvent or other material in which PCBs are at least 5 percent soluble (by weight). A volume of PCB-free fluid sufficient to cover the contaminated surface completely must be used in each wash/rinse. The wash/rinse requirement does not mean the mere spreading of solvent or other fluid over the surface, nor does the requirement mean a once-over wipe with a soaked cloth. Precautions must be taken to contain any runoff resulting from the cleansing and to dispose properly of wastes generated during the cleansing.

15. *Standard wipe test.* For spills of high concentration PCBs on solid surfaces, this policy requires cleanup to numerical surface standards and sampling by a standard wipe test to verify that the numerical standards have been met. This definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard-size template (10 centimeters (cm) X 10 cm) will be used to delineate the area of cleanup; the wiping medium will be a gauze pad or glass wool of known size which has been saturated with hexane. It is important that the wipe be performed very quickly after the hexane is exposed to air. EPA strongly recommends that the gauze (or glass wool) be prepared with hexane in the laboratory and that the wiping medium be stored in sealed glass vials until it is used for the wipe test. Further, EPA requires the collection and testing of field blanks and replicates.

16. *Requirements and standards.* The term "requirements," as used in this policy means both the procedural responses and numerical decontamination levels set forth in this policy as constituting adequate cleanup of PCBs. The term "standards" means the numerical decontamination levels set forth in this policy.

17. *Spill area.* The term means the area of soil on which visible traces of the spill can be observed plus a buffer

zone of 1 foot beyond the visible traces. Any surface or object (e.g., concrete sidewalk or automobile) within the visible traces area, or on which visible traces of the spilled material are observed, is included in the spill area. This area represents the minimum area assumed to be contaminated by PCBs in the absence of precleanup sampling data and is thus the minimum area which must be cleaned.

18. *Spill boundaries.* The term means the actual area of contamination as determined by postcleanup verification sampling, or by precleanup sampling to determine actual spill boundaries. EPA can require additional cleanup when necessary to decontaminate all areas within the spill boundaries to the levels required in this policy (e.g., additional cleanup will be required if postcleanup sampling indicates that the area decontaminated by the responsible party, such as the spill area as defined in paragraph 13 of this unit, did not encompass the actual boundaries of PCB contamination).

IV Requirements for PCB Spill Cleanup

A. General Requirements

Unless expressly limited, the reporting, disposal, and precleanup sampling requirements in this unit apply to all spills of PCBs at concentrations of 50 ppm or greater which are subject to decontamination requirements under TSCA, including those spills listed in Unit II.A.1 through 6 which are excluded from the final cleanup standards in Units IV. B and C.

1. *Reporting requirements.* The following reporting is required in addition to applicable reporting requirements under the CWA or CERCLA. For example, under the National Contingency Plan all spills involving 10 lbs or more of PCB material must currently be reported to the National Response Center (1-800-424-8802). The requirements below are designed to be consistent with existing reporting requirements to the extent possible so as to minimize reporting burdens on the governments as well as the regulated community.

a. Where a spill directly contaminates surface water, sewers, or drinking water supplies (see discussion under Unit II.A), the responsible party shall notify the appropriate EPA regional office (the Office of Pesticides and Toxic Substances Branch) and obtain guidance for appropriate cleanup measures in the shortest possible time after discovery, but in no case later than 24 hours after discovery.

b. Where a spill directly contaminates grazing lands or vegetable gardens (see discussion under Unit II.A), the responsible party shall notify the appropriate EPA regional office (the Office of Pesticides and Toxic Substances Branch) and proceed with the immediate requirements specified in Unit IV.B or C, depending of the source of the spill, in the shortest possible time after discovery, but in no case later than 24 hours after discovery.

c. Where a spill exceeds 10 pounds of PCB material (generally 1 gallon of PCB dielectric fluid) and is not addressed in paragraph 1.a. or b. of this unit, the responsible party will notify the appropriate EPA regional office and proceed to decontaminate the spill area in accordance with this TSCA policy in the shortest possible time after discovery, but in no case later than 24 hours after discovery. For purposes of the notification requirement, the 10 pounds are measured by the weight of the PCB-containing material spilled rather than by the weight of only the PCBs spilled.

d. Spills of 10 pounds of less which are not addressed in paragraphs 1. a. or b. of this unit must cleaned up in accordance with this policy (in order to avoid EPA enforcement liability), but notification of EPA is not required.

2. *Disposal of cleanup debris and materials.* All contaminated soils, solvents, rags, and other materials resulting from the cleanup of PCBs under this policy shall be properly stored, labeled, and disposed of in accordance with the provisions of 40 CFR 761.60.

3. *Determination of spill boundaries in the absence of visible traces.* For spills where there are insufficient visible traces yet there is evidence of a leak or spill, the boundaries of the spill are to be determined by using a statistically based sampling scheme.

B. Requirements for Cleanup of Low-Concentration Spills Which Involve Less Than 1 LB PCBs By Weight (Less Than 270 Gallons of Untested Mineral Oil)

1. *Decontamination requirements.* Spills of low-concentrations PCBs (as defined in Unit III) which involve less than 1 pound of PCBs by weight (i.e., less than 270 gallons of untested mineral oil containing less than 500 ppm PCBs) shall be cleaned in the following manner:

a. Solid surfaces must be double washed/rinsed (as defined in Unit III) except that all indoor, residential surfaces other than vault areas must be cleaned to 10 micrograms per 100 square centimeters (100 $\mu g/cm^2$) by standard commercial wipe tests.

b. All soil within the spill area (i.e., visible traces of soil and a buffer of 1 lateral foot around the visible traces) must be excavated and the ground be restored to its original configuration by back-filling with clean soil (i.e., containing less than 1 ppm PCBs).

c. Requirements in paragraphs 1. a. and b. of this unit must be completed within 48 hours after the owner of the equipment, facility, or other source of PCBs (the responsible party) was notified or became aware of the spill.

2. *Effect of emergency or adverse weather.* Completion of cleanup may be delayed beyond 48 hours in case of circumstances including but not limited to, civil emergency, adverse weather conditions, lack of access to the site, and emergency operating conditions. The occurrence of a spill on a weekend or overtime costs are not acceptable reasons to delay response. Completion of cleanup may be delayed only for the duration of the adverse conditions. If the adverse weather conditions, or time lapse due to other emergency, have left insufficient visible traces, the responsible party must use a statistically based sampling scheme to determine the spill boundaries as required in Unit IV.A.3.

3. *Records and certification.* At the completion of cleanup, the responsible party or appropriate agent shall document the cleanup with records and certification of decontamination. The records and certification must be maintained for a period of 5 years. The records and certifiction shall consist of the following:

a. Indentification of the source of the spill, e.g., type of equipment.

b. Estimated or actual date and time of the spill occurrence.

c. The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

d. A brief description of the spill location.

e. Precleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces, and a brief description of the sampling methodology used to establish the spill boundaries.

f. A brief description of the solid surfaces cleaned and of the double wash/rinse method used.

g. Approximate depth of soil excavation and the amount of soil removed.

h. A certification statement signed by the responsible party or his/her designated agent (e.g., a facility manager or foreman) stating that the cleanup requirements have been met and that the information contained in the record is true to the best of his/her knowledge.

While not required for compliance with this policy, the following information would be useful if maintained in the records: (1) Additional pre- or postcleanup sampling: and (2) the estimated cost of the cleanup by man-hours, dollars, or both.

C. Requirements for Cleanup of High-Concentration Spills and Low-Concentration Spills Involving 1 LB or More PCBs By Weight (270 Gallons or More of Untested Mineral Oil)

Cleanup of low-concentration spills involving 1 lb or more PCBs by weight, and of all other spills of regulated materials shall be considered complete if all of the immediate requirements, cleanup standards, sampling, and recordkeeping requirements below are met.

1. *Immediate requirements.* The following four actions must be taken as quickly as possible and within no more than 24 hours (or within 48 hours for PCB Transformers) after the owner of the equipment or container from which the spill occurred, or other responsible representative of the owner such as a facility manager, was notified or became aware of the spill, except that actions described in paragraphs 1. b., c., and d. of this unit may be delayed beyond 24 hours if circumstances (e.g., civil emergency, hurricane, tornado, or other similar adverse weather conditions, lack of access due to physical impossibility, or emergency operating conditions) so require for the duration of the adverse conditions. The occurrence of a spill on a weekend or overtime costs are not acceptable reasons to delay response. Owners of spilled PCBs who have delayed cleanup because of these types of circumstances must keep records documenting the fact that circumstances precluded rapid response. The responsible party shall:

a. Notify the EPA regional office and the NRC as required by Unit IV.A.1 or by other applicable statutes.

b. Effectively cordon off or otherwise delineate and restrict an area encompassing any visible traces plus a 3-foot buffer, and place clearly visible signs advising persons to avoid the area, to minimize the spread of contamination as well as the potential for human exposure.

c. Record and document the area of visible contamination, noting the extent of the visible trace areas and the center of the visible trace area. If there are no visible traces, the responsible party shall record this fact and contact the regional office of the EPA for guidance in completing statistical sampling of the spill area to establish spill boundaries.

d. Initiate cleanup of all visible traces of the fluid on hard surfaces and initiate removal of all visible traces of the spill on soil and other media, such as gravel, sand, oyster shells, etc.

If there has been a delay in reaching the site and there are insufficient visible traces of PCBs remaining at the spill site, the owner of the PCBs must estimate (based on the amount of material missing from the equipment or container) the area of the spill and immediately cordon off the area of suspect contamination. The owner must then utilize a statistically based sampling scheme to identify the boundaries of spill area as soon as practicable.

Although this policy requires certain immediate actions, as described above, EPA is not placing a time limit on completion of the cleanup effort since the time required for completion will vary from case to case. However, the Agency expects that decontamination will be achieved promptly in all cases and will consider the promptness of completion in determining whether a responsible party made good faith efforts to clean up in accordance with this policy.

2. *Requirements for decontaminating spills in outdoor electrical substations.* Spills which occur in outdoor electrical substations (as defined in Unit III) shall be decontaminated in accordance with paragraphs a. and b. of this unit. Conformance to the cleanup standards in paragraphs a. and b. of this unit shall be verified by postcleanup sampling as specified in Unit V. At such times as outdoor electrical substations are converted to another use, the spill site shall be cleaned up to the non-restricted access requirements in Unit IV.C.4.

a. Contaminated solid surfaces (both impervious and non-impervious) shall be cleaned to a PCB concentration of 100 $\mu g/100\ cm^2$ (as measured by standard wipe tests).

b. At the option of the responsible party, soil contaminated by the spill will be cleaned: (1) To 25 ppm PCBs by weight, or (2) to 50 ppm PCBs by weight provided that a label or notice is visibly placed in the area. Upon demonstration by the responsible party that cleanup to 25 ppm or 50 ppm will jeopardize the integrity of the electrical equipment at the substation, the EPA regional office may establish an alternative cleanup method or level and place the responsible party on a reasonably timely schedule for completion of cleanup.

3. *Requirements for decontaminating spills in other restricted access areas.* Spills which occur in restricted access locations other than outdoor electrical substations (as defined in Unit III) shall be decontaminated in accordance with paragraphs 3.a through e. of this unit. Conformance to the cleanup standards in paragraphs a. through e. of this unit shall be verified by postcleanup sampling as specified in Unit V. At such times as restricted access areas other than outdoor electrical substations are converted to another use, the spill site shall be cleaned up to the nonrestricted access area requirements under Unit IV.C.4.

a. High-contact solid surfaces (see definition of high-contact industrial surfaces in Unit III) shall be cleaned to 10 $\mu g/100\ cm^2$ (as measured by standard wipe tests).

b. Low-contact, indoor, impervious solid surfaces will be decontaminated to 10 $\mu g/100\ cm^2$.

c. At the option of the responsible party, low-contact, indoor, nonimpervious surfaces will be cleaned either: (1) To 10 $\mu g/100\ cm^2$; or (2) to 100 $\mu g/100\ cm^2$ and encapsulated. The Regional Administrator, however, retains the authority to disallow the encapsulation option for a particular spill situation upon finding that the uncertainties associated with that option pose special concerns at that site. That is, the Regional Administrator would not permit encapsulation if he/she determined that if encapsulation failed at a particular site this failure would create an imminent hazard.

d. Low-contact, outdoor surfaces (both impervious and non-impervious) shall be cleaned to 100 $\mu g/100\ cm^2$.

e. Soil contaminated by the spill will be cleaned to 25 ppm PCBs by weight.

4. *Requirements for decontaminating spills in non-restricted access areas.* Spills which occur in nonrestricted access locations (as defined in Unit III) shall be decontaminated in accordance with paragraphs 4.a. through e. of this unit. Conformance to the cleanup standards in paragraphs 4.a. through e. of this unit shall be verified by postcleanup sampling as specified in Unit V. At such times as outdoor electrical substations and other restricted access areas are converted to another use, the spill site shall be cleaned up to the non-restricted access area requirements.

a. Furnishings, toys, and other easily replaceable household items shall be disposed of in accordance with the provisions of 40 CFR 761.60 and replaced by the responsible party.

b. Indoor solid surfaces and high-contact outdoor solid surfaces (see definition of high contact residential/

commercial surfaces in Unit III) shall be cleaned to 10 $\mu g/100\ cm^2$ (as measured by standard wipe tests).

c. Indoor vault areas, and low-contact, outdoor, impervious solid surfaces shall be decontaminated to 10 $\mu g/100\ cm^2$.

d. At the option of the responsible party, low-contact, outdoor, nonimpervious solid surfaces shall be either: (1) cleaned to 10 $\mu g/100\ cm^2$; or (2) cleaned to 100 $\mu g/100\ cm^2$ and encapsulated. The Regional Administrator, however, retains the authority to disallow the encapsulation option for a particular spill situation upon finding that the uncertainties associated with that option pose special concerns at that site. That is, the Regional Administrator would not permit encapsulation if he/she determined that if the encapsulation failed the failure would create an imminent hazard at the site.

e. Soil contaminated by the spill will be decontaminated to 10 ppm PCBs by weight, provided that soil is excavated to a minimum depth of 10 inches. The excavated soil will be replaced with clean soil (i.e., containing less than 1 ppm PCBs), and the spill site will be restored (e.g., replacement of turf).

5. *Records.* The responsible party or appropriate agent shall document the cleanup with records of decontamination. The records must be maintained for a period of 5 years. The records and certification shall consist of the following:

a. Identification of the source of the spill (e.g., type of equipment.)

b. Estimated or actual date and time of the spill occurrence.

c. The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

d. A brief description of the spill location and the nature of the materials contaminated (this information should include whether the spill occurred in an outdoor electrical substation, other restricted access location, or in a nonrestricted access area).

e. Precleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces, and a brief description of sampling methodology used to establish the spill boundaries.

f. A brief description of the solid surfaces cleaned.

g. Approximate depth of soil excavation and the amount of soil removed.

h. Postcleanup verification sampling data and, if not otherwise apparent from the documentation, a brief description of the sampling methodology and analytical technique used.

While not required for compliance with this policy, information on the estimated cost of cleanup (by man-hours, dollars, or both) would be useful if maintained in the records.

EPA will soon issue for publication in the **Federal Register** a proposed rule to require these recordkeeping measures to facilitate EPA's monitoring of PCB spill cleanups.

V. Sampling Requirements

Postcleanup sampling is required to verify the level of cleanup under Unit IV.C. 2 through 4. The responsible party, or designated agent, may use any statistically valid, reproducible, sampling scheme (either random samples or grid samples), provided that the requirements of paragraphs 1. and 2. of this unit are satisfied.

1. The sampling area is the greater of (1) an area equal to the area cleaned plus an additional 1-foot boundary, or (2) an area 20 percent larger than the original area of contamination.

2. The sampling scheme must ensure 95 percent confidence against false positives.

3. The number of samples must be sufficient to ensure that areas of contamination of a radius of 2 feet or more within the sampling area will be detected, except that the minimum number of samples is 3 and the maximum number of samples is 40.

4. The sampling scheme must include calculation for expected variability due to analytical error.

EPA recommends the use of the sampling scheme developed by the Midwest Research Institute (MRI) for use in EPA enforcement inspections: "Verification of PCB Spill Cleanup by Sampling and Analysis." Guidance for the use of this sampling scheme is available in the MRI report "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup." Both the MRI sampling scheme and the guidance document are available from the TSCA Assistance Office at the address and telephone number given under "FOR FURTHER INFORMATION CONTACT." The major advantage of this sampling scheme is that it is designed to characterize the degree of contamination within the entire sampling area with a high degree of confidence while using fewer samples than any other grid or random sampling scheme. This sampling scheme also allows some sites to be characterized on the basis of composite samples.

At its discretion, EPA may take samples from any spill site. If EPA's sampling indicates that the remaining concentration level exceeds the required level, EPA will require further cleanup. For this purpose, the numerical level of cleanup required for spills cleaned in accordance with Unit IV.B are deemed to be the equivalent of numerical cleanup requirements required for cleanups under Unit IV.C. 2 through 4. EPA may sample using its best engineering judgment, a statistically valid random or grid sampling technique, or both. When using engineering judgment or random "grab" samples, EPA will take into account that there are limits on the power of a grab sample to dispute statistically based sampling of the type required of the responsible party. EPA headquarters will provide guidance to the EPA regions on the degree of certainty associated with various grab sample results.

VI. EPA Enforcement and the Effect of Compliance With This Policy

Although a spill of material containing 50 ppm or greater PCBs is considered improper PCB disposal, this policy establishes requirements that EPA considers to be adequate cleanup of the spilled PCBs. Cleanup in accordance with this policy means compliance with the procedural as well as the numerical requirements of this policy. Compliance with this policy creates a presumption against both enforcement action for penalties and the need for further cleanup under TSCA. The Agency reserves the right, however, to initiate appropriate action to compel cleanup where, upon review of the records of cleanup, EPA finds that the decontamination levels in the policy have not been achieved. The Agency also reserves the right to seek penalties where the Agency believes that the responsible party has not made a good faith effort to comply with all provisions of this policy, such as prompt notification of EPA of a spill, recordkeeping, etc.

EPA's exercise of enforcement discretion does not preclude enforcement action under other provisions of TSCA or any other Federal statute. This includes, even in cases where the numerical decontamination levels set forth in this policy have been met, civil or criminal action for penalties where EPA believes the spill to have been the result of gross negligence or knowing violation.

The TSCA policy has been reviewed by the Office of Management and Budget.

This concludes EPA's TSCA policy. Unit VII, which follows, contains the rationale for the policy, the data on which the policy was based, and the areas in which EPA lacks data. EPA solicits information to fill those gaps.

VII. Development of the TSCA Spill Cleanup Policy

As will become apparent in the discussion below, there are gaps in the information which was available to the Agency in developing the TSCA policy. The EPA designed the TSCA policy to enable the Agency and the regulated industry to gather data for filling the gaps. In all cases, through the cleanup levels established in the TSCA policy and by retaining authority to require additional cleanup where warranted, EPA has placed sufficient controls on the party responsible for cleanup to ensure that future PCB spills will be cleaned to levels that do not pose an unreasonable risk of injury to human health or the environment. The TSCA policy reflects the Agency's best judgment in light of available information. However, the Agency welcomes comment on, and additional relevant information about, the TSCA policy.

A. Risks Posed by Leaks and Spills of PCBs

1. *Frequency, amount, and nature of leaks and spills.* The TSCA policy establishes the measures which EPA considers to constitute adequate cleanup of PCB contamination resulting from activities regulated under TSCA. EPA expects that the TSCA policy will be most frequently applied to leaks and spills of PCBs which occur during the use of authorized equipment such as electrical transformers and capacitors. Thus, EPA's evaluation of the risks posed by spills of PCBs and the costs associated with cleanup following these spills focuses primarily on leaks and spills of PCBs from electrical transformers and capacitors.

EPA estimates that there are 121,000 (askarel) PCB Transformers currently in use, over 20 million mineral oil transformers contaminated with PCBs currently in use, and over 2.8 million large PCB Capacitors currently in use. Available data indicate that on an annual basis, about 3.3 percent of (askarel) PCB Transformers in use will leak or spill PCBs. The average PCB leak or spill from a PCB Transformer is 5.3 gallons, or about 66 pounds of PCBs. On an annual basis, EPA expects that about 264,000 pounds of PCBs are leaked or spilled into the environment from PCB Transformers.

EPA expects that about 17,000 of these PCB Transformers are located in electrical substations, where 37,000 pounds of spilled PCBs would be expected to be released each year. EPA expects that about 27,000 PCB Transformers are located in industrial facilities, where an estimated 59,000 pounds of PCBs are spilled each year. Finally, 77,000 PCB Transformers are located in other areas (most likely, in or near commercial buildings), where an estimated 168,000 pounds of PCBs are released each year.

EPA expects that of the over 20 million PCB-containing mineral oil transformers in use, 76 percent are located in residential neighborhoods and public areas (i.e., schools, shopping centers, etc.). The majority of these transformers contain less than 500 parts per million PCBs. Available data indicate that the average leak or spill of PCBs from mineral oil transformers contains less than one-tenth of a tablespoon of PCBs, or 0.08 ounce of PCBs. On an annual basis, EPA expects that 627 pounds of PCBs are spilled from mineral oil transformers in residential and public areas. The remaining mineral oil transformers are located in outdoor electrical substations, industrial facilities, and rural areas. EPA estimates that less than 200 pounds of PCBs are leaked from these transformers each year.

Based on available data, EPA estimates that there are over 2.8 million PCB Capacitors in use. Of these 2.8 million capacitors, EPA estimates that 1.6 million are in use in substations or generating facilities and 1.2 million are inside buildings and on utility poles throughout the distribution system. Of the 1.6 million PCB Capacitors in use in electrical substations, EPA expects that over 12,000 leak each year, releasing about 200,000 pounds of PCBs. Of the 1.2 million PCB Capacitors in use inside buildings and on utility poles, EPA expects that over 9,000 leak each year, releasing about 154,000 pounds of PCBs.

Electrical transformers generally contain 100 times the amount of PCBs contained within PCB Capacitors. PCB Transformers typically contain between 300 and 500 gallons of PCB dielectric fluid, while PCB Capacitors generally contain about 3 gallons of PCB dielectric fluid. Unlike PCB Transformer spills, the majority of PCB Capacitor spills involve the violent rupture of the capacitor and the spraying of PCBs. Thus, PCBs spilled from energized capacitors are generally more widely distributed in the spill area than PCBs spilled from transformers. Available data indicate that for over 80 percent of capacitor spills, PCBs are distributed as far as 11 feet from the center of the spill.

PCBs spilled from transformers are more likely to leak from gaskets and valves, and the area contaminated from these types of spills is more directly related to the amount of spilled material than is the case for explosive ruptures, such as occur from energized capacitors. EPA conducted a crude experiment in order to predict the maximum lateral spread of PCBs from other than explosive ruptures of electrical transformers; the maximum spread of water on low-porosity surfaces was tested and assumed to be equivalent to the maximum lateral spread of PCBs and PCB-contaminated oils on soil. EPA found that for every gallon of material spilled, one could expect a maximum area of contamination of about 3 square meters (m^2). Although with time one would see a slight increase in lateral spread (assuming no runoff), for the most part, a 1 gallon spill of PCB material from a transformer cleaned up within 2 weeks of the spill would not be expected to contaminate greater than a $3m^2$ area. This assumes of course that the material has not been tracked into other areas in the interim and that weather conditions have not caused further lateral spread. Spills of PCBs from deenergized capacitors, other authorized equipment, and containers of PCBs would be expected to behave in a similar manner to leaks and spills of PCBs from non-explosive transformer spills.

To summarize, the total amount of PCBs released from electrical transformers and capacitors each year from leaks and spills of PCBs is estimated at about 620,000 pounds (out of an estimated 163 million pounds of PCBs in use in this equipment). Of these PCBs, 38 percent are spilled in electrical substations and 62 percent of these PCBs are spilled in residential/commercial areas, rural areas, and industrial facilities. The majority of spilled PCBs are spilled from capacitors, and capacitor spills typically result from violent ruptures and lead to the distribution of PCBs at distances as far away as 11 feet from the center of the spill (total average spill area is about 380 square feet).

PCBs spilled from deenergized capacitors, transformers (excluding transformers involved in fires), other authorized equipment, and PCB Containers generally involve nonviolent ruptures and the maximum spread of the spilled material can be estimated by assuming $3m^2$ of contamination per gallon of spilled material.

2. *Toxicity and environmental persistence.* EPA has concluded that PCBs are both toxic and persistent. In earlier rulemakings and Agency PCB health effects review documents, EPA has determined that persons exposed to PCBs can develop chloracne (a

disfiguring skin illness), and that based on laboratory animal data, there is a potential for reproductive effects and developmental toxicity as well as oncogenicity in humans exposed to PCBs. EPA has also concluded that PCBs are resistant to degradation and that they bioaccumulate and bioconcentrate in the fatty tissue of organisms. PCBs are very stable compounds which can persist for years when released into the environment. A more detailed discussion of EPA's findings on the health effects of PCBs can be found in the July 10, 1986 **Federal Register** (51 FR 28172).

Recently, the Office of Health and Environmental Assessment (OHEA) at EPA developed draft health advisories for PCBs in soil for use by EPA's Office of Emergency and Remedial Response (OERR). These health advisory levels are to be used as guidelines for initiating removal action for sites contaminated with PCBs. The draft health advisories developed by OHEA address both the oncogenic risks and other than oncogenic risks posed to humans by exposures to PCBs in soils at various levels.

The cancer potency slope factor for PCBs has been estimated by EPA's Cancer Assessment Group (CAG) and the Office of Toxic Substances (OTS) to be 4.34 $(mg/kg/day)^{-1}$ and 3.57 $(mg/kg/day)^{-1}$, respectively. An average of these values (4.0 $(mg/kg/day)^{-1}$) was used in the OHEA draft health advisories as the PCB cancer potency factor. The OHEA calculation of the human dose associated with a 1×10^{-6} level of oncogenic risk is 0.0175 microgram/day. The Agency's assessment of risks associated with dermal and inhalation exposure to PCBs on solid surfaces was also based upon a cancer potency slope factor of 4.0 $(mg/kg/day)^{-1}$ for PCBs.

3. *Potential for exposure to spilled PCBs.* In evaluating potential routes of exposure to PCBs which are leaked and spilled, EPA looked at the potentional for exposure in nonrestricted access areas, restricted access areas, and restricted access, outdoor electrical substations. Further, since the TSCA policy is designed to apply to the large majority of spill situations, EPA focused on the routes of potential exposure associated with typical spill situations. Unique spill scenarios which present greater potential exposures or additional routes of exposure are excluded from application of the cleanup levels in the TSCA policy.

In developing the cleanup standards for PCB spills into soil and other ground media, EPA relied primarily on the exposure and risk analysis in the OHEA health advisories for PCBs in soil. Exposure estimates used to evaluate the risk associated with various cleanup standards for solid surfaces such as metals, wood, asphalt, and concrete were developed by the EPA's Office of Toxic Substances. Neither the OHEA assessment for PCBs in soil nor the OTS estimates of exposure to PCBs in soil assume PCB contamination of other potential exposure pathways such as surface water, drinking water supplies, sewer systems, vegetable gardens, or grazing lands.

EPA believes that the large majority of spills which occur after the effective date of the TSCA policy will not involve these additional routes of exposure. Those exceptional spill situations which would result in these additional routes of exposure are excluded from the TSCA policy and must be cleaned up to levels determined by the appropriate EPA regional office. EPA excluded these spill situations from the scope of the policy because such spills may have to be cleaned up to lower levels in recognition of the potential for additional human exposures. Whether or not more stringent cleanup standards are necessary for these exceptional spill situations, the additional routes of potential exposure require some degree of evaluation on a case-by-case basis before making a final decision on appropriate cleanup levels in such circumstances.

Further, spills of PCBs into sand, soil, gravel, and other similar materials in special areas within the residential/commercial setting (i.e., areas where people may come into repeated daily contact, such as children's sandboxes, spills which pose particular concerns about future ground water contamination, spills which involve the combustion of PCBs (and the possible formation of toxic combustion byproducts such as polychlorinated dibenzofurans (PCDFs) and polychlorinated dibenzodioxins (PCDDs)), and spills onto farmland may be required to be cleaned up to lower levels, in recognition of the increased potential for exposure. The EPA regional offices should be contacted for guidance on appropriate cleanup for these types of spills.

The OTS dermal exposure assessments for PCBs on solid surfaces such as metal, concrete, and asphalt assume that PCBs are transferred to the skin at a relatively high rate (50 percent or more). This assumption is based on the results of an EPA-sponsored study on the transfer of PCBs from glass and unpainted metal to skin (human skin and pig skin) upon contact. EPA currently lacks data on the rate of transfer of PCBs from rougher, porous surfaces such as concrete, asphalt or wood to human skin. Although EPA expects that the transfer rate may be significantly lower for rough, porous surfaces, in the absence of more extensive data, EPA has assumed that the transfer rate would be the same as for glass and unpainted steel.

a. *Exposures in nonrestricted access areas.* Areas which do not limit public access by man-made or naturally occurring barriers (i.e., residential, commercial, and unrestricted access rural areas) generally present the greatest potential for a high degree of human exposure to spilled PCBs. Spills of PCBs in residential/commercial areas may involve: (1) The contamination of soil, grass, sand, gravel, and other ground materials; (2) the contamination of outdoor solid surfaces such as metal, concrete, asphalt, and wood; (3) the contamination of indoor solid surfaces such as ceilings, walls, and floors; (4) the contamination of indoor vault areas; and (5) the contamination of household items such as clothing, toys, and patio furniture.

Spills of PCBs in unrestricted access rural areas may involve the contamination of materials like those listed under paragraphs (1) and (2) of this unit. Since human exposures to PCBs spilled in unrestricted access rural areas may at times approach levels of exposure in residential/commercial areas, EPA has included unrestricted access rural areas under the standards for residential/commercial spills. Typical exposures would, however, be expected to be lower in rural areas compared to typical exposures in the residential/commercial setting.

i. *Exposures from outdoor spills into soil, sand, gravel, and other similar materials.* The principal routes of exposure to PCBs spilled into soil in residential areas would be through inhalation and ingestion. Dermal exposures may also occur, although EPA expects that the PCBs will adsorb to the soil particles, reducing the rate of dermal absorption. OHEA has calculated the expected levels of human exposure to PCBs through inhalation and ingestion when PCBs are present at different levels in soil.

The OHEA assessment concludes that a PCB level of 1 to 6 ppm PCBs in soil in a residential/commercial area would be associated with a 1×10^{-5} level of oncogenic risk. OHEA assumed that the contaminated area is 0.5 acre (18,225 square feet), that 0.6 gram of soil is ingested per day at ages 0 to 6, and that the population is exposed for 50 percent of their lifetime. The placement of a 10-

inch cap of clean soil on top of soil containing 1 to 6 ppm PCBs reduces the expected level of oncogenic risk by an order of magnitude (to 1×10^{-6}).

ii. *Exposures to spills onto solid surfaces*—a. *Outdoor surfaces.* PCBs spilled onto outdoor solid surfaces such as metal, concrete, asphalt, or utility poles in residential areas would result in some inhalation exposures and infrequent dermal exposure. For solid surfaces to which people would be expected to have frequent contact, higher levels of dermal exposure would be expected.

Examples of low-contact outdoor solid surfaces include asphalt and concrete roadways, roof areas, unmanned machinery, concrete pads beneath electrical equipment, curbing, and external structural building components. The estimated level of oncogenic risk associated with exposures to low-contact outdoor surfaces in residential/commercial settings (using reasonable worst-case assumptions about exposures to surface levels of 10 μg/100 cm²) is between 1×10^{-5} and 1×10^{-6}.

Sidewalks and patios where children play, fences, and automobiles are examples of residential/commercial surfaces to which people may come into frequent daily contact. The estimated level of oncogenic risk associated with exposures to such higher contact outdoor surfaces in residential/commercial settings (using reasonable worst-case assumptions about exposures to surfaces levels of 0.5 to 1.0 μg/100 cm²) is between 1×10^{-5} and 1×10^{-6}.

b. *Indoor surfaces.* Spill onto indoor hard surfaces may occur when outdoor electrical equipment ruptures catastrophically and sprays PCBs into a room through an open window or door. Spills onto indoor hard surfaces may also occur when electrical equipment inside a building leaks or spills PCBs and the leaked or spilled PCBs are distributed outside the electrical equipment room into other areas of the building through ventilation equipment and ductwork or by tracking. Inhalation exposures and dermal exposures would be expected following a spill of PCBs onto an indoor hard surface. Based on EPA's assessment of the risks posed by spills of PCBs onto indoor hard surfaces, dermal exposures would be expected to be the exposure route of highest concern (inhalation exposures to residual indoor PCB levels of 10 μg/100 cm² are associated with a 1×10^{-6} level of oncogenic risk, while dermal exposures to this same level of PCBs on a low-contact indoor surface are associated with a 1×10^{-5} level of oncogenic risk).

From a perspective of dermal exposure, there are two types of potentially contaminated surfaces: low-contact surfaces and high-contact surfaces. Low-contact surfaces are those which are infrequently touched. In a residential/commercial setting, ceilings and wall areas above 6 feet in height would be considered low-contact surfaces. High-contact surfaces are those which are repeatedly contacted, often for relatively long periods of time. High-contact surfaces in a residential/commercial area include uncovered flooring, wall areas below 6 feet in height, stairways, bannisters, and railings. The estimated level of oncogenic risk associated with dermal exposures to 1 μg/100 cm² of PCBs on low-contact indoor hard surfaces is between 1×10^{-5} and 1×10^{-6}. The National Institute of Occupational Safety and Health (NIOSH) has reported that 0.5 μg/100 cm² is background level of PCBs on indoor hard surfaces, and this level of residual contamination on a high-contact indoor hard surface would be associated with a level of oncogenic risk between 1×10^{-5} and 1×10^{-6}.

c. *Easily replaceable/high-contact items.* PCBs released from electrical transformers or capacitors in indoor residential/commercial areas may result in the contamination of nonstructural, easily replaceable materials to which people have repeated daily contact (i.e., clothing, household furnishings, paper, notepads, office supplies, patio furniture, toys, swingsets, etc.). Since PCBs are expected to be readily absorbed through the skin, dermal contact with PCBs spilled onto these types of high-contact materials could result in significant exposures. Materials such as paper, clothing, and toys would themselves absorb the PCBs and be difficult, if not impossible, to clean completely. These materials would, however, be expected to release the PCBs slowly, resulting in continued dermal exposures to low levels of PCBs over a prolonged period of time. Depending upon the extent of contamination, inhalation exposures from these types of contaminated high-contact materials could also be significant.

iii. *Spills in indoor vault areas*—a. *Transformer vault areas and electrical equipment rooms.* One of the more common areas of PCB contamination from leaks and spills of PCBs from inuse electrical equipment are indoor transformer vault areas and electrical equipment rooms. Exposures to PCBs may occur through both inhalation and dermal routes, although since many transformer vaults and electrical equipment rooms are well ventilated (reducing airborne PCB concentrations in the vaults), the route of exposure of highest concern in an electrical equipment room would be the dermal route. From the perspective of inhalation exposures alone, residual PCB levels of 10 μg/100 cm² would be associated with oncogenic risks below 1×10^{-6}. Dermal exposures to PCBs on floors, ceilings, and walls in vault areas would be expected to be less than dermal exposures to PCBs on low-contact surfaces in residential/commercial areas because of less frequent contact with the contaminated surfaces. Residual PCB levels (on ceilings, floors, and walls) of 10 μg/100 cm² in vault areas would be associated with a 1×10^{-5} to 1×10^{-6} level of oncogenic risk.

b. *Exposures in industrial and other restricted access (nonsubstation) locations.* PCB spills in the industrial setting may result in: (1) Outdoor contamination of soil, sand, gravel, and other similar materials; (2) contamination of both indoor and outdoor hard surfaces; and (3) indoor contamination of vault areas and electrical equipment rooms.

i. *Outdoor contamination of soil, sand, etc.* The principal route of human exposure to PCBs from a spill in soil is through the inhalation route. Soil ingestion and dermal contact with soil would not be expected to be significant routes of exposure at a restricted access site. PCB levels in soil of 25 ppm would present less than a 1×10^{-7} level of oncogenic risk to people on-site who work more than 0.1 km from the actual spill area (assuming that the spill area is less than 0.5 acre).

ii. *Contamination of hard surfaces.* Hard surfaces which may become contaminated in an industrial area include items such as lathes and other types of industrial equipment and machinery, in addition to surfaces such as asphalt, concrete, and wood. In industrial areas, outdoor hard surfaces such as concrete, asphalt, and structural building components would not be expected to result in as frequent exposures as may occur for these surfaces in a residential/commercial area. Thus, residual PCB levels on these outdoor industrial surfaces of 100 μg/100 cm² (following cleanup of an "askarel" spill) would not be expected to result in significant exposures.

Indoor contamination of structural building components in industrial areas (e.g., ceilings, walls, and floors) and contamination of vaults or electrical equipment rooms would result in some inhalation exposures, but the principal route of exposure would be expected to be through dermal contact. Residual

PCB levels of 10 $\mu g/100\ cm^2$ on indoor low-contact surfaces in industrial areas would not be expected to result in significant exposures.

The highest exposure to surface contamination in an industrial setting would be to industrial workers using machinery contaminated with PCBs. Such workers may experience repeated dermal exposures to PCBs, and others may also experience such exposures if this equipment is sold, transported and/or reused. Dermal contact with PCBs may also lead to oral exposures during meals and while smoking. Depending upon the level of contamination, inhalation may also be significant, since workers using machinery are expected to be in close proximity to the equipment during its use. Higher levels of inhalation exposure can be anticipated if the contaminated equipment is operated under conditions of elevated temperature, since this would increase the volatility of any PCBs present on the equipment. Residual PCB levels of 0.5 $\mu g/100\ cm^2$ (reported by NIOSH as the background level for PCBs) on these types of high-contact surfaces would not result in significant exposures.

c. *Exposures in outdoor electrical substations.* PCBs released from transformers or capacitors in fenced-off electrical substations pose little risk of directly exposing members of the general population to PCBs. Electrical substations are typically located at distances greater than 0.1 kilometer from population areas and are generally fenced off to restrict access to authorized maintanance personnel only. Dermal and inhalation exposures by maintenance workers would, however, occur during servicing activities, an oral exposures may result from the transfer of PCBs from the hands to the mouth during meals or while smoking. Populations located at distances of greater than 0.1 kilometer from the site of the spill may incur inhalation exposures. However, the OHEA assessment document indicates that PCB levels in soil between 220 and 1,300 ppm present a 1×10^{-7} level of oncogenic risk to populations located at distances of 1 km or more from spill areas. Thus, PCB levels of 50 ppm in soil in an outdoor electrical substation would not be expected to result in significant exposures to the general population.

PCB spills onto hard surfaces in outdoor electrical substations may result in inhalation exposures and dermal exposures primarily to maintenance workers. The general population would not be expected to incur significant inhalation exposures, and dermal contact would be unlikely given the fact that these areas are fenced off and have restricted access. Residual PCB levels of 100 $\mu g/100\ cm^2$ would not be expected to result in significant exposures to either the occasional maintenance worker or the general population.

4. *Conclusions about PCB leaks and spills.* Leaks and spills of PCBs from PCB Equipment in residential/commercial areas present the greatest potential for human exposure, when compared to other types and locations of PCB spills. The potential for exposure is high. Oral, dermal, and inhalation exposures to PCBs from spills in residential areas are likely, expecially among children. Human exposures to PCBs spilled in unrestricted access rural areas also may at times be comparable to exposures in the residential setting. Available data on leaks and spills of PCBs indicate that the majority of PCBs spilled from PCB Equipment are spilled from PCB Capacitors and that there are many of these capacitors in use in residential areas.

Potential exposure to spilled PCBs or residual PCBs after cleanup of a spill in a restricted-access area is generally limited to industrial workers. Some types of contamination in restricted-access industrial facilities pose worker exposures as great as residential/commercial exposures. For example, contamination of control panels or manually operated machinery can result in frequent, if not continuous, dermal exposure to industrial workers. Other than any high-contact, manned equipment which may be located outdoors, spills outdoors in an industrial setting will result in a lesser degree of inhalation exposure to workers and the general population than similar spills in residential/commercial settings.

Spills in outdoor electrical substations pose the lowest potential exposures. Outdoor electrical substation are generally fenced off to restrict access to authorized personnel only. There is some possibility of dermal and inhalation exposures to maintenance workers. However, exposure to maintenance workers is less likely to be of a continuous or frequent nature than exposures to industrial workers.

B. Costs of Cleanup

1. *Factors influencing the cost of cleanup.* The cleanup of spilled PCBs from transformers and capacitors typically consists of a number of different measures: (1) Securing the spill site, (2) formulating a spill cleanup plan based on the nature of the spill, (3) removing or repairing the leaking equipment, (4) removing contaminated material (e.g., soil), (5) cleaning contaminated surfaces and decontaminating or removing equipment contaminated during cleanup, (6) properly disposing of contaminated materials, (7) ensuring proper cleanup by sampling and chemical analysis, and (8) restoring the site.

The costs associated with phases (1), (2), (3), and (8) above are fairly fixed and will not vary significantly with more, less stringent cleanup requirements. The costs associated with cleanup phases (4), (5), (6), and (7) above are the more variable elements influencing the total cost of cleanup and are affected by several factors, including the concentration of PCBs spilled, the amount of PCB material spilled, the size or boundary of the spill area (often influenced by the time lapse between spill occurrence and cleanup), and the nature and stringency of cleanup requirements.

According to information gathered by OTS staff in telephone surveys and, in a few cases, written comments, the two most significant cost factors associated with various target cleanup levels are: (1) The number of times cleanup crews have to be sent to the site; and (2) whether or not postcleanup sampling is required. The imposition of sampling costs automatically has the effect of requiring that cleanup crews have to make at least two trips to the site (at least once to clean and at least once to restore the site after the sampling results have verified cleanup). The more stringent cleanup requirements are, the more likely that more than one attempt at cleanup will have to be made and that more than one set of samples will have to be taken.

Thus, the effect of stringent cleanup requirements coupled with requirements for postcleanup verification by sampling is to (1) mitigate exposures by ensuring a greater degree of cleanup; (2) exacerbate exposures by leaving the site open for a longer period of time; and (3) increase the costs of complying with the policy. EPA weighed these countervailing considerations in establishing the various cleanup requirements in the TSCA policy. The balance between the benefits associated with potential risk reductions on the one hand, and potential additional risks and costs imposed by more stringent requirements on the other, weigh out differently depending on the potential for exposure and the degree of certainty that less stringent requirements will result in adequate cleanup.

As is discussed below, EPA has limited data on the cost of cleanup, particularly in the area of cleaning solid surfaces such as metal or concrete to various levels. Further, the data that are available cannot readily be analyzed to determine the impact of variables other than the degree of cleanup and the extent of sampling performed at the site (e.g., amount spilled, types of ground materials or surfaces contaminated, and time lapse between spill occurrence and cleanup). EPA has evaluated available data and estimated the ranges of incremental costs associated with cleanup to various levels.

a. *Cleanup of spills in soil, sand, gravel, etc.* Available information suggests that the cost of cleanup of soil to "background" levels of PCBs can be 3 to 15 times greater than the cost of cleanup to 50 ppm. Further, since PCBs are ubiquitous in the enviroment and are found at low concentrations throughout the world (in areas where PCBs have never been used), target levels for PCBs spill cleanup which are lower than background levels in certain areas can result in very high cleanup costs. Large volumes of soil may have to be excavated for the removal of what may ultimately be only 1 to 2 pounds of PCBs. For example, there are about 2 pounds of PCBs present in four truckloads of soil containing 25 ppm PCBs. After excavation, these 2 pounds of PCBs may, under the PCB disposal regulations, be transferred to a PCB landfill for disposal.

EPA estimated the costs associated with the cleanup of a PCB spill in soil using two sets of available data on the costs of cleanup. One set of data on the costs associated with the cleanup of a 0.5 acre site contaminated with PCBs and PCB Equipment suggests that cleanup to 50 ppm would cost on the order of $105,000; cleanup to 25 ppm would cost on the order of $214,000; and cleanup to "background" levels of PCBs would cost on the order of $279,000. Using these data to estimate cleanup costs for different target levels of soil cleanup for typical PCB Capacitor spills, EPA estimates that the cleanup of a typical PCB Capacitor spill to 50 ppm would cost on the order of $2,100; cleanup to 25 ppm PCBs would cost on the order of $4,280; and cleanup to "background" levels of PCBs would cost on the order of $5,580.

EPA also estimated the costs of cleanup to various target levels using data on the cost of cleanup in actual capacitor spill situations. These data indicate that while the costs of cleanup to level between 50 and 25 ppm do not vary significantly, cleanup to levels lower than 25 and 20 ppm result in dramatically higher costs of cleanup. Based on these actual capacitor spill cleanup data, the cleanup of a typical PCB Capacitor spill to 50 or 25 ppm would cost on the order of $4,000; cleanup to 10 ppm PCBs would cost on the order of $10,000; and cleanup to background levels could cost on the order of $60,000 to $140,000.

EPA estimates that the actual incremental costs of cleaning typical capacitor spills to various levels would fall in the range between the two sets of estimates. Assuming that there are about 20,000 PCB Capacitor spills each year, EPA's estimates of the total annual cost of cleanup of PCB Capacitor spills to 50 ppm, 25 ppm, and "background" levels is $42–80 million, $80–86 million, and $112 million to over $2 billion, respectively.

Alternatively, information indicates that for lower concentration spills (i.e., spills of material containing less than 500 ppm PCBs—generally from oil-filled electrical equipment), cleanup of visible traces plus a 1 foot boundary of spills onto soil and other ground media within a few days of the spills will sufficiently ensure that PCB concentrations in the soil will be cleaned to a few parts per million. Therefore, the additional costs associated with sampling may not be justified by any incremental risk reduction where the spill is of low-concentration spills.

b. *Cleanup of PCBs spilled on surfaces.* EPA lacks data on the practicality, feasibility, and incremental costs associated with the cleanup of PCBs on hard surfaces. Comments from utility representatives as well as EPA regional office personnel suggest that costs of cleaning solid surfaces are significantly influenced by the nature of the contaminated surface (i.e., whether it is a porous surface such as concrete or an inpervious surface such as metal). Thus, cleaning porous, hard surfaces to 1 $\mu g/10cm^2$ may be very difficult, if not impossible, to achieve through generally accepted methods of cleanup (i.e., scrubbing and cleansing of surfaces) because of the penetration of PCBs below the surface.

EPA has evaluated some data on the costs of cleaning PCB-contaminated surfaces to various levels. However, all of the available data are from historical PCB spill sites which are typically more difficult to clean than fresh spills. Further, EPA's experience suggests that the relative difficulty of cleaning porous surfaces versus impervious surfaces increases as the amount of time between spill occurrence and cleanup increases.

Surface cleanup standards which are not achievable would in effect require the breakup and removal of materials such as concrete. Data on the breakup, removal, and replacement of concrete materials at historical spill sites indicate that the costs of such remedial action may range from one to several million dollars. While historical sites generally involve more extensive areas of cleanup, both in terms of PCBs absorbed into the materials and the area of contamination, these data do suggest that there are significant costs associated with a removal requirement for solid surfaces. EPA, however, has no comparative cost data on the differences in cost between cleaning solid surfaces by conventional methods versus removing solid surfaces.

An EPA-sponsored Midwest Research Institute study of the removal of PCBs from surfaces such as painted and unpainted steel, asphalt, concrete block, wood, and poured concrete demonstrates fairly clearly that a time lapse of several days before initiation of cleanup can significantly impede the efficacy of surface cleanup methods. That study also suggests that the washing of rough, porous hard surfaces with solvent is not very effective in removing the spilled askarel PCBs. Cleanup by washing/wiping within a few days following low concentration spills, however, is expected to be effective in reducing surface concentrations of PCBs to levels which will not pose unreasonable risks. This is primarily because of the small amount of PCBs actually present in most mineral oil spills.

In lieu of potentially impracticable surface cleanup standards, or removal standards, EPA also considered the option of requiring cleanup to an achievable surface cleanup standard and encapsulation with an appropriate epoxy resin or other sealant. Anecdotal information suggests that encapsulation is likely to be less costly than removal of solid surfaces by 1 to 3 orders of magnitude. While EPA believes that encapsulation can significantly reduce both dermal and inhalation exposure to residual PCB concentrations on solid surfaces, the Agency is aware of no empirical data which verify the effectiveness of encapsulants in reducing exposures. Ancedotal information provided by EPA regions and members of the regulated community raises doubts as to the long-term effectiveness of encapsulation because of the tendency of many sealants to peel or chip off over time.

In the absence of adequate data on the costs of cleaning fresh PCB spills on solid surfaces, the standards which appear in the TSCA policy for the cleanup of hard surfaces primarily reflect concerns about the potential for exposure to these levels of residual PCBs which remain after cleanup. The TSCA policy does allow for less stringent cleanup options coupled with EPA-approved encapsulation measures where the spill occurs on porous surfaces outdoors (or on low-contact surfaces indoors in restricted-access facilities) because of concerns about the achievability of more stringent cleanup levels on porous surfaces. The encapsulation option is allowed for certain low-contact solid surfaces in order to allow the development of data on the efficacy of encapsulation in mitigating exposures to residual PCBs on solid surfaces.

2. *Conclusions about costs of cleanup.* The costs associated with the cleanup of spills of PCBs into soils and other similar materials are principally influenced by the area of contamination and the target levels set for cleanup. The lower the target level, the more testing, excavation, and removal, and the higher the cost. The cleanup of spilled PCBs in soil from PCB Transformers and Capacitors to "background" levels of PCBs costs three times as much to an order of magnitude more than cleanup to 50 ppm, and several times as much as cleanup to 25 ppm. On an annual basis, hundreds of millions of dollars are being spent for the cleanup of PCBs from transformer and capacitor spills.

EPA expects that the costs associated with the cleanup of contaminated surfaces will increase as cleanup levels or standards decrease and that at some point, excavation and removal may be the only choice to reduce PCB levels further. Data on the practicality, feasibility, and cost of cleanup to the levels discussed in this TSCA policy and data on the effectiveness and cost of encapsulation are necessary so that EPA can more accurately weigh the cost effectiveness of various surface cleanup requirements.

EPA is seeking data on the incremental costs associated with the cleanup of different types of surfaces to the levels discussed in this TSCA policy. In the absence of data to support a determination that these levels are not practically achievable at a reasonable cost (or data that support a determination that exposures will be significantly lower than those assumed by current Agency assessments), the policy includes the surface cleanup standards discussed in Unit IV.

EPA is also seeking data on the effectiveness (in terms of risk reduction), cost, and long-term durability of the use of sealants and encapsulating materials. If encapsulating materials and sealants can be demonstrated to be more cost effective than removal, EPA will retain the provisions allowing, for low-contact, porous surfaces, the use of such sealants in lieu of cleanup to more stringent standards.

C. Risk/Benefit Discussion of Cleanup Requirements

1. *Scope and general requirements of the policy.* The TSCA policy applies to spills which EPA can require to be cleaned under TSCA enforcement authority (spills of 50 ppm or greater PCBs which generally occur during EPA-regulated use, processing, distribution in commerce, or storage of PCBs) and which occur after the effective date of the policy. The policy is prospective because historical spills tend to involve more extensive areas of contamination and because many of the requirements of the policy are based on the assumption that the spill area will be cleaned or contained within 1 or 2 days of spill occurrence.

PCB is an oily material which leaves stains on soil and surfaces. While EPA recognizes that the visibility of PCBs on soils and surfaces is inversely related to the amount of time elapsed from release to discovery and that weather conditions may also influence spill visibility, EPA expects that for the majority of PCB spills, visible traces of PCBs will remain at the time of spill discovery. The exception to this rule is for spills which are undiscovered for an extended period of time and spills which are followed by adverse/severe weather conditions. In these cases, the TSCA policy requires the use of an appropriate statistical sampling scheme to define the boundaries of the spill area.

EPA believes that one of the principal ways of minimizing human and environmental exposures to spilled PCBs is to prevent the spread of spilled PCBs (e.g., by cordoning off the area) and to initiate cleanup actions as soon as practically possible. This minimizes the likelihood that materials will be spread beyond the spill area through tracking and runoff and reduces the probability of surface water and drinking water contamination. EPA believes that response time in initiating remedial action may be one of the most significant factors influencing the magnitude of risks following PCB spills, especially in residential areas.

2. *Spills of low concentrations PCBs involving less than one lb of PCBs.* Where the spilled material is relatively low in PCB concentration (i.e., containing 50 ppm or greater, but less than 500 ppm PCBs), the TSCA policy allows cleanup in accordance with procedural performance requirements (i.e., double wash/rinse for solid surfaces and removal of visible traces plus a 1-foot lateral boundary for soil and other ground media provided that the minimum depth of excavation is 10 inches) rather than requiring sampling to verify that numerical cleanup standards have been met.

The procedural requirements are based upon data indicating that for low-concentration spills, double washing/rinsing of surfaces and removal of visible traces plus a buffer on soil will successfully reduce the PCB concentration in the spill area to the numerical standards specified for the higher concentration spills. The essential difference is that for spills of low-concentration PCBs, sampling is not required to verify that numerical standards are achieved, provided that the responsible party or designated agent certifies that the cleanup has been performed in accordance with all of the requirements of the policy. The enforcement provisions of the policy specify that should the sampling data indicate that the numerical standards have not been met, or that the area cleaned does not encompass all areas of actual contamination (as determined by sampling or indicated by remaining visible traces), the regional office will require additional cleanup.

3. *Spills of 500 ppm or greater PCBs and spills of low-concentration PCBs of more than 1 lb PCBs by weight*—a. *Spills in nonrestricted access areas.* The most stringent requirements for the cleanup of spilled PCBs apply to PCB spills in residential/commercial/unrestricted access rural areas. The TSCA policy requires that materials such as household furnishings, toys, and swingsets be disposed of rather than decontaminated. Generally, these types of materials pose a high potential for exposure and are very difficult to clean. Indeed, the costs of cleanup of these types of materials to the limit of detection of PCBs (which would be required given the high potential for repeated daily exposures) would in many cases exceed replacement costs.

Soil and other similar materials in residential/commercial areas must be cleaned up to 10 ppm PCBs, and a cap of clean materials containing less than 1 ppm PCBs (the average background level for PCBs in soil) equal to a minimum of 10 inches must be placed on top of the excavated area. The OHEA risk assessment for PCBs in soil indicates that 1 to 6 ppm PCBs in 0.5 acre of residential soil is associated with a 1×10^{-5} level of oncogenic risk and that placing a 10-inch cap of clean soil reduces this level of oncogenic risk by an order of magnitude PCB Capacitor spills typically result in the contamination of significantly less than 0.5 acre.

For an average PCB Capacitor spill, the difference in costs associated with cleaning up PCBs to 10 ppm versus to below 1 ppm ("background" levels) in a residential area is estimated to be about $500. Assuming 9,000 PCB Capacitor spills each year in residential areas, the estimated incremental costs associated with cleanup of these spills to less than 1 ppm versus cleanup to 10 ppm is $4.5 million.

Thus, EPA believes that soil containing 10 ppm PCBs (covered by a cap containing PCBs below the practical limits of quantitation) in a residential/commercial area would not present unreasonable risks to public health or the environment.

The surface standards presented in the TSCA policy are based primarily on the potential for exposure to PCBs remaining on surfaces in residential/commercial areas and the estimated level of risk posed by these residual PCBs. EPA lacks data on the incremental costs associated with cleanup to different surface standards and is soliciting these data.

The TSCA policy does allow for less stringent surface cleanup options coupled with EPA-approved encapsulation measures where the spill occurs on porous, low-contact surfaces outdoors because of concerns about the achievability of more stringent cleanup levels on porous surfaces. The encapsulation option is allowed for low-contact solid surfaces outdoors in order to allow the development of data on the efficacy of encapsulation in mitigating exposures to residual PCBs on solid surfaces.

b. *Industrial and other restricted access spills.* Spills of PCBs in industrial areas and other restricted access locations would present lower risks than spills in residential/commercial areas because access to these areas is controlled. Inhalation exposure is considered to be the principal route of exposure to PCBs in soil, sand, or gravel in an industrial area. Dermal exposures would, however, be likely when PCBs are spilled on manned machinery and equipment. EPA believes that the level of risk posed by 25 ppm PCB in soil at a restricted access facility would not present significant risks either to the typical worker or to the general public. EPA also believes that the surface standards of 100 μg/100 cm^2 for low-contact outdoor surfaces and 10 μg/100 cm^2 for indoor low-contact surfaces (and vaults) and high-contact surfaces in a restricted access industrial facility would not present significant risks to workers or to the general population.

Further, there are significant costs associated with the cleanup of soil, sand, gravel, and other similar materials in an industrial facility to background levels compared to cleanup to 25 ppm PCBs. Thus, EPA believes that cleanup of soil, sand, gravel, and other similar materials in an industrial facility to 25 ppm would not present unreasonable risks to public health or the environment.

The surface standards for industrial facilities and other restricted access locations which are presented in the TSCA policy are based on the expected level of exposure to residual PCBs left on industrial surfaces after cleanup. EPA lacks data on the incremental costs associated with cleanup to different standards and is soliciting these data. The TSCA policy does allow for less stringent cleanup options coupled with EPA-approved encapsulation measures where the spill occurs on porous, low-contact surfaces because of concerns about the achievability of more stringent cleanup levels on porous surfaces. The encapsulation option is allowed for certain low-contact solid surfaces in order to allow the development of data on the efficacy of encapsulation in mitigating exposures to residual PCBs on solid surfaces.

c. *Outdoor electrical substation spills.* The least stringent requirements for the cleanup of spilled PCBs apply to spills in outdoor electrical substations. This reflects the lower potential for exposures and fewer people potentially at risk of exposures to PCBs spilled in these areas. Spills of PCBs from PCB Equipment into solid materials such as soils in electrical substations must be cleaned up to 25 ppm PCBs or to 50 ppm PCBs, provided that a label is placed in the spill area indicating that a PCB spill has occurred. The OHEA risk assessment for PCBs in soil indicates that a PCB level of 50 ppm PCBs in soil located more than 1 kilometer from a population would present less than a 1×10^{-7} level of oncogenic risk. This risk assessment assumes only inhalation exposures at distances of 1.0 kilometer (or approximately 1,093 yards) from the spill site.

The surface standards which appear in the TSCA policy are primarily based on the expected exposures and risks posed by contact with the residual PCBs. EPA lacks data on the incremental costs associated with cleanup to higher or lower levels.

D. Scope of the Policy

EPA expects the large majority of PCB spills subject to decontamination under TSCA to conform to the typical spill scenarios considered in developing the TSCA policy. However, some small percentage of spills will warrant more stringent cleanup requirements because of additional routes of exposure or significantly greater exposures than those associated with typical PCB spills. Further, there may be exceptional spill situations which require less stringent cleanup or a different approach to cleanup because of factors associated with the particular spill which mitigate expected exposures and risks or which make cleanup to these requirements impracticable. Therefore, the policy (1) excludes certain situations from the scope of this policy; (2) discusses other spill situations which may warrant the use of EPA authority to require more stringent requirements and (3) retains EPA flexibility to allow alternative or less stringent decontamination measures when the responsible party demonstrates the presence of risk-mitigating factors or demonstrates the impracticability of applying this policy to a particular spill situation. For those exceptional spill situations which are excluded from the policy or in which EPA may exercise flexibility based on site-specific considerations, the EPA regions have the authority to determine cleanup requirements.

The TSCA policy excludes certain spill situations from the automatic applications of the numerical cleanup requirements in the policy (i.e. spills directly into water, sewers, vegetable gardens, and grazing areas, and spills which directly contaminate surface waters prior to cleanup) because those situations will always present routes of exposure to PCBs which are not associated with the typical spills considered in developing the TSCA policy. These exceptional spill situations may not always require more extensive cleanup. However, they will always require some level of site-specific analysis to determine appropriate cleanup measures.

Although EPA expects the majority of remaining spills to be subject to this policy, occasionally the site-specific characteristics (e.g., depth to ground water, type of soil, and the presence of a shallow well) may pose exceptionally high potential for ground water contamination by residual PCBs (i.e., those PCBs remaining after cleanup to the standards specified in this policy). Spills which pose a high degree of potential for ground water contamination are not automatically excluded from the policy as are spills into surface waters because the presence of such potential may not be readily apparent. EPA feels that automatically excluding such spills from the scope of the policy could result in the delay of cleanup—a particularly undesirable outcome if potential ground water contamination is a significant concern. The Agency will, however, require cleanup to more stringent decontamination standards upon making a determination that such additional cleanup is necessary because of ground water concerns associated with residual contamination based upon comparison of the site characteristics to ground water modeling and exposure assessments which have been developed by EPA in support of this policy.

Additionally, spill situations involving significantly larger areas of contamination than those assumed in developing this policy (e.g., < 0.5 acre in soil and 550 ft² on indoor surfaces), spills in areas involving repeated daily contact such that the potential for dermal contact may be significantly higher than assumed in developing this policy (e.g., spills resulting from violent equipment rupture during which PCDFs and/or PCDDs were formed, and spills onto farmland on which root crops are grown) may require more stringent levels of cleanup. In such situations, the Regional Administrator may require cleanup in addition to that required by the policy. In those circumstances, the Regional Administrator must notify the Director, Office of Toxic Substances, of his finding and the basis for the finding.

The TSCA policy also retains EPA's flexibility to allow less stringent, or alternative decontamination measures based upon site-specific considerations. EPA will exercise this flexibility if the responsible party demonstrates that cleanup to the numerical decontamination levels is clearly unwarranted because of risk-mitigating factors, or that compliance with the procedural requirements or numerical standards in the policy is impracticable at a particular site. For example, the responsible party may show that a dirt road need not be decontaminated to the levels in this policy because exposure to residual PCB concentrations on a dirt road will be significantly mitigated when the road is paved with concrete or asphalt in the immediate future. Alternatively, the responsible party may demonstrate that cleanup to the numerical standards in the policy may threaten the structural integrity of major equipment installations or buildings.

For purposes of delineating the scope of the TSCA policy, as well as to provide EPA regional offices and the regulated community with guidance on whether a particular spill may require more stringent standards for cleanup, EPA has performed some preliminary analyses of these potentially higher-risk spill situations. EPA evaluated the exposures and risks associated with these potential higher-risk situations using reasonable worst-case assumptions to identify cases where strict application of the standards in this policy may be inappropriate. In addition, EPA believes that some spill situations may require special action (e.g., additional immediate actions to prevent contamination of sewers where there is a real potential for such contamination).

1. *Spills into sewers.* EPA has not assessed the exposures associated with the release of PCBs into sewers because of the lack of information about the behavior of spilled PCBs in a system of sewer pipes. Being denser than water, PCBs may collect in depressions and irregularities in the sewer pipes, providing a long-term source of release of PCBs into the environment. On the other hand, the PCBs may be carried from place to place in the sewer system. Thus, there is no method for estimating which segments of the system are contaminated, what the concentration of PCBs is, or how long the PCBs will remain in the system. Because of the difficulty of evaluting the behavior of PCBs in sewer systems and because of the practical problems of decontaminating a sewer system, PCB spills into sewage are not covered by this policy. Each regional office will determine the requirements for adequate cleanup of sewer systems, treatment works, and sewage contaminated with PCBs on a case-by-case basis.

2. *Spills which may result in ingestion exposure through drinking water and fish.* To evaluate the potential for exposures through the ingestion of drinking water and/or fish contaminated with PCBs, EPA looked at four spill situations using reasonable worst-case assumptions: (1) PCBs are spilled into a pond and the sediment is cleaned to 10 ppm; (2) PCBs are spilled into a river and the sediment is cleaned to 10 ppm; (3) PCBs are spilled on the bank of a stream and the soil is cleaned to 25 ppm; and (4) PCBs are spilled on soil and cleaned to 25 ppm, assuming that the PCBs will enter ground water.

Preliminary results indicate that where PCBs enter surface water in a pond, the ingestion of fish and/or drinking water from the pond after the sediment has been cleaned to 10 ppm in accordance with the policy may result in significant human exposures. While rivers have higher flow rates than ponds, so that cleanup of river sediment to 10 ppm PCBs may not pose significant human exposures, PCB contamination in surface water poses important considerations in addition to the risks associated with residual PCB concentrations in sediment, in much the same way as sewer contamination. Thus, all spills directly into waterways and spills which contaminate waterways before cleanup are excluded from the TSCA policy.

Where PCBs are spilled near a waterway and the soil is cleaned to 25 ppm PCBs, PCBs can enter surface water through runoff from the contaminated bank. (EPA assumed that runoff into the stream occurs only after the spill area has been cleaned to 25 ppm.) Based on reasonable worst-case assumptions, the consumption of drinking water and/or fish from the stream for 70 years will not pose risks of concern and are therefore included in the scope of the policy. However, should the spill contaminate surface water cleanup, the spill must be cleaned to site-specific requirements. Therefore, the responsible party should take special measures to contain the spill area and prevent the spread of PCBs into the waterway.

In looking at the possible exposures associated with soil cleaned to 25 ppm through the ingestion of drinking water from contaminated ground water, the climate, soil and ground water configuration were assumed to be such as to maximize PCB concentrations in ground water. Significant risks may be posed by the ingestion of drinking water from very shallow wells (i.e., dug wells taking in water at the source of loading) in areas where soil characteristics and depth to aquifer maximize the potential for leaching into ground water. However, the ingestion of drinking water from a well located a horizontal distance of 50 meters from the spill site in these areas does not appear to pose significant risks. Thus, while the majority of spills will not result in unreasonable risks of human exposure due to ground water contamination, some unique spill scenarios will pose potential ingestion exposure through ground water contamination.

The TSCA policy specifically reserves EPA's authority to impose more stringent cleanup requirements in cases where site characteristics present special risks of ingestion of PCBs through ground water contamination. These spills are not automatically excluded from application of the policy because the potential for ground water contamination may not be readily apparent.

3. *Ingestion of milk from dairy cattle grazing on land contaminated with PCBs.* Using reasonable worst-case estimates, the Agency evaluated the potential risks to humans drinking milk from cattle which grazed on farmland where a PCB spill has been cleaned to 25 ppm. In the event of a spill on farmland, grazing dairy cattle can ingest the PCB-contaminated soil by consuming soil while grazing and from eating plants and roots from a PCB-contaminated site. The cattle can then accumulate unmetabolized residues of the PCBs in milk fat and excrete them through milk. Assuming that the contaminated milk is consumed by the farm residents, worst-case risk estimates indicate that reducing the PCB concentration in the soil to 10 or 25 ppm PCBs may not be adequate to prevent aganist unreasonable risks to human health.

4. *Ingestion of vegetables grown on contaminated home gardens and farmland.* EPA performed some preliminary analyses of the risks posed by the consumption of vegetables grown on a spill area cleaned to 25 ppm PCBs in the case of farmland and 10 ppm in the case of residential gardens. Assuming that vegetables grown on that garden or farm are used to provide the entire vegetable component of the diet of the site residents, cleaning soil to the levels in the policy may not be adequate. Vegetables are more likely to become contaminated through contact with contaminated dirt rather than through plant uptake. Thus, EPA believes that the potential for exposure to spilled PCBs through ingestion of crops grown on-site is greatest where the vegetables are root crop (e.g., carrots and potatoes).

5. *Exposure from larger spills.* In the above situations, the Agency focused on routes or ingestion exposure. The Agency has also evaluated situations which may significantly increase dermal or inhalation exposures. A principal factor in determining the magnitude of inhalation exposure is the size of the spill area. In estimating the risks associated with the cleanup levels in the policy for typical spills from electrical equipment, EPA relies on a risk assessment which assumes a contaminated area of 0.5 acre (see discussion in Unit VII.A.3.). Since the area of the typical spill addressed by this policy is expected to be 1/20 of the size assumed in the risk assessment, EPA believes that the cleanup standards in this policy sufficiently protect against unreasonable risks from inhalation exposure to PCBs remaining after the cleanup of a spill from electrical equipment. Cleanup standards for larger spills, that is, greater than 0.5 acre, would be established by the EPA regional office after a consideration of both the level of risk posed by cleanup to different levels and the incremental costs associated with such cleanup.

E. Issues

As is apparent in the discussion under Unit VII.A, there are gaps in the information which was available to the Agency in developing the TSCA policy, particularly in the area of cleanup costs. Given the limited data available to the Agency in developing a PCB Spills Cleanup Policy under the TSCA unreasonable risk standard, EPA has generally taken an environmentally conservative approach by establishing cleanup requirements based on risk and exposure considerations, and by excluding certain potentially higher-risk spill scenarios from the scope of the policy.

In a few areas where available data support the conclusion that less restrictive requirements will not compromise the protection of human health or the environment, the Agency has allowed less restrictive cleanup options (i.e., the exclusion of low-concentration spills from sampling requirements and the encapsulation option for spills on low-contact, porous surfaces). One purpose of allowing such options is to provide an opportunity for the development of additional information on the relative efficacy and costs of such options. EPA expects that the regulated industry will make good faith efforts to submit additional data gathered under the TSCA policy.

1. *Decontamination of surface.* The TSCA policy includes surface standards (in micrograms (μg) per 100 square centimeters (100 cm^2)) for cleanup of PCB spills on hard surfaces such as wood, concrete and asphalt, and impervious surfaces such as metal or glass. For spills of PCBs at concentrations of 50 ppm or greater but less than 500 ppm onto hard or impervious surfaces in other than residential/commercial areas, this policy allows cleanup by double rinsing with an appropriate solvent.

The consensus proposal submitted by EDF, NRDC, EEI, NEMA, and CMA in May 1985 proposed that surfaces in residential areas be cleaned to 100 μg/100 cm^2. The consensus further proposed that surfaces in all other areas be cleaned either to 100 μg/100 cm^2 or triple rinsed at the discretion of the responsible party. A revised consensus proposal submitted in October 1986 modified the proposed surface standards to 10 μg/100 cm^2 for impervious surfaces in areas other than outdoor electrical substations. The revised proposal maintained the 100 μg/100 cm^2 level for all porous surfaces, arguing the infeasibility of cleaning to lower levels on porous surfaces.

After reviewing the consensus proposal, the Agency contemplated requiring that potential high-contact surfaces be cleaned to 10 μg/100 cm^2 and that spills of 500 ppm or greater on low-contact surfaces be cleaned to 100 μg/100 cm^2. The Agency further contemplated allowing the triple-rinse option for spills of 500 ppm or greater in reduced access areas and for all spills onto surfaces in outdoor electrical substations.

Lacking adequate information with which to assess potential exposures to surfaces cleaned to those levels, the Agency initiated some studies to (1) evaluate the risks posed by the 10 μg/100 cm^2 and 100 μg/100 cm^2 and (2) test the efficacy of rinsing/washing as a cleanup measure. The results of these studies indicate (a) that high contact surfaces such as those in residential play areas or manually operated machinery may require surface standards more stringent than the 10 μg to 100 μg/100 cm^2 standards and (b) that while even one wash or rinse of a solid surface would be adequate for mineral oil spills (50 to 499 ppm PCBs), the wash/rinse procedural performance standard is relatively ineffective in removing higher concentration PCBs from porous surfaces such as concrete block, wood, and asphalt. Presented below is additional detail on these preliminary studies and requests for data and information pertaining to the cleanup of surfaces.

2. *Surface wiping as a cleanup method.* EPA began the study with the goal of evaluating the effectiveness of a triple-rinse performance standard for decontamination of various types of surfaces where spills of askarel or mineral oil contaminated with PCBs have occurred. The cleaning agents tested were a water-based industrial cleaner (Penetone Power Cleaner 155) and kerosene, which are both widely used. A set of six rinses were performed on steel, wood, concrete, and asphalt 1 day after spilling a known amount of PCBs on the surfaces. Another set of six rinses was performed on each surface 8 days after spilling a known amount of PCBs on the surface.

The rinses were relatively effective in cleaning askarel spills on steel and in cleaning mineral oil from all surfaces (because of the low initial concentration of PCBs in mineral oil). However, six rinses with the industrial cleaner did not successfully remove askarel fluid from asphalt, wood, or concrete. Further, the PCBs and the solvent washed through the wood, concrete, and asphalt, and distributed the PCBs into the material. This has caused EPA to question the advisability of setting a surface concentration for nonimpervious materials. Absent information on whether or not the PCBs absorbed into the material later come back to the surface and become available for exposure, EPA must assume that the absorbed PCBs provide a continuing source of exposure until the total amount of PCBs in the material is depleted.

EPA also found that the Penetone Power Cleaner was significantly less effective than the organic solvent in reducing the concentration of PCBs. Anecdotal information, however, suggests that the detergent cleaner may be more effective on soiled surfaces because of the tendency of PCBs to bind to dirt.

These observations have led to some determinations and raised several issues. Any comments or data in these areas are welcome.

a. EPA has determined that a procedural performance specifying one to three washes/rinses on solid surfaces within a few days after the spill occurs will result in adequate decontamination of mineral oil (50 to 499 ppm PCBs) spills on hard surfaces (including wood, asphalt, and concrete).

b. EPA has determined that water-based solvents may not be effective in removing PCBs from hard surfaces. Seven days after the occurrence of a spill, the efficacy of water-based rinses appeared to decrease markedly even on steel (some of the reduced effectiveness of the water-based solvent after 7 days may be due to the loss of PCBs from the surface through volatilization). EPA is currently performing a second phase of the solvent-rinse study with an organic solvent used widely in industry.

c. EPA has determined that when a spill of PCBs occurs on nonimpervious hard surfaces, the PCBs are absorbed into the material and may later become available for exposure. In the absence of adequate information, the Agency must presume that these PCBs do provide a source of exposure. The Agency solicits any available data in this area.

d. Therefore, for PCB spills on nonimpervious surfaces, the Agency considered (1) requiring removal and decontamination to a ppm standard, or (2) some combination of a wipe standard and encapsulation. EPA solicits available information on the costs of removing hard sufaces and the efficacy of encapsulation in preventing future exposures to PCBs which have been absorbed into materials such as concrete, wood, or asphalt. In its spills cleanup policy the Agency has allowed an encapsulation option on low contact surfaces for iterative purposes. EPA may not retain such an option if no information on the relative cost, effectiveness, and durability of encapsulation becomes available.

3. *Cost of cleanup.* The cost estimates for decontamination of soil and other solid materials to various levels (as discussed under Unit VII.B) were derived from limited available information. While the Agency has received information on the costs of actual cleanups, it is difficult to extrapolate information from these data because very little is known about the cleanup methods used, the time lapse between the spill and the cleanup effort, the amount spilled, and the size of the spill area.

In order to develop a more sound data base for comparing the costs of cleanup to various levels in soil, the Agency modeled the vertical and lateral spread of spilled PCBs in soil over time, using assumptions which maximize the spread of PCBs. These data on the distribution of PCB concentrations in the soil are being used to solicit information from cleanup firms on the incremental cost of cleanup to various levels.

Any available data on the incremental costs of decontamination to various levels are welcome. Such data will be most helpful if accompanied by the following information: (1) The amount and concentration of PCBs spilled, (2) the area and depth of the original contamination and the area cleaned, (3) the amount of soil or other material removed or the type of cleanup performed on hard surfaces, (4) postcleanup sampling data, (5) the amount of time between spill occurrence and initiation of cleanup, and (6) some description of the cleanup procedures (e.g., initial efforts to contain the spill or methods used to prevent the spreading of contamination during cleanup efforts). EPA especially needs data on the costs associated with cleanup of hard surfaces (see discussion in previous unit).

4. *Cleanup standards for higher-risk situations.* The discussion under Unit VII.D details the Agency's rationale for limitations on the scope of the policy. The Agency believes that some small percentage of spills will warrant more stringent cleanup requirements than specified in the TSCA policy because of additional routes of exposure or significantly greater exposures than those associated with typical PCB spills.

Therefore, certain spill situations are excluded from the scope of this policy. The spill situations which the TSCA policy excludes from automatic application of the numerical cleanup requirements in the policy (i.e., spills directly into water, sewers, vegetable gardens, and grazing areas and spills which contaminate surface waters prior to cleanup) are those which will always present routes of exposure to PCBs which are not associated with the typical spills considered in developing the TSCA policy. The TSCA policy indicates exceptional spill situations may not always require more extensive cleanup. However, they will always require some level of site-specific analysis to determine appropriate cleanup measures.

In addition, the TSCA policy discusses other spill situations which may warrant the use of EPA authority to require more stringent requirements (e.g., where depth to ground water, type of soil, and the presence of a shallow well may pose exceptionally high potential for ground water contamination by residual PCBs; spill situations involving significantly larger areas of contamination than those assumed in developing this policy; spills resulting from violent equipment rupture during which PCDFs and/or PCDDs were formed; and spills onto farmland on which root crops are grown). The TSCA policy provides that in such situations the Regional Administrator may require cleanup in addition to that required by the TSCA policy.

EPA does not currently have sufficient information on the factors which must be considered in determining the type and degree of cleanup in such situations. Therefore, while EPA headquarters will provide guidance to the EPA regional offices to the extent possible on a case-by-case basis, the TSCA policy does not specify cleanup measures for these spill scenarios. EPA solicits available data on such spill situations in order to provide better guidance to the regions and to develop uniform guidance for such situations where appropriate.

This document was submitted for review to the Office of Management and Budget (OMB).

Other Statutory Requirements

Regulatory Flexibility Act

The TSCA policy will have an insignificant impact on small entities as described in the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

Paperwork Reduction Act

The TSCA policy reiterates certain recordkeeping requirements for the disposal of PCBs which were approved under OMB control number 2070-0008. Some additional recordkeeping and reporting will be added through the rulemaking process; these requirements will be submitted to OMB for clearance.

List of Subjects in 40 CFR Part 761

Hazardous substances, Labeling, Polychlorinated biphenyls, Recordkeeping and reporting requirements, Environmental protection.

Dated: March 20, 1987.

Lee M. Thomas,

Administrator.

PART 761—[AMENDED]

Therefore, 40 CFR Chapter I Part 761 is amended as follows:

1. The authority citation for Part 761 is revised to read as follows:

Authority: 15 U.S.C. 2605, 2607, and 2611; Subpart G is also issued under 15 U.S.C. 2614 and 2616.

2. Subpart G, consisting at this time of §§ 761.120, 761.123, 761.125, 761.130, and 761.135, is added to read as follows:

Subpart G—PCB Spill Cleanup Policy

Sec.

761.120 Scope.
761.123 Definitions.
761.125 Requirements for PCB spill cleanup.
761.130 Sampling requirements.
761.135 Effect of compliance with this policy and enforcement.

Subpart G—PCB Spill Cleanup Policy

§ 761.120 Scope.

(a) *General.* This policy establishes criteria EPA will use to determine the adequacy of the cleanup of spills resulting from the release of materials containing PCBs at concentrations of 50 ppm or greater. The policy applies to spills which occur after May 4, 1987.

(1) Existing spills (spills which occurred prior to May 4, 1987, are excluded from the scope of this policy for two reasons:

(i) For old spills which have already been discovered, this policy is not intended to require additional cleanup where a party has already cleaned a spill in accordance with requirements imposed by EPA through its regional offices, nor is this policy intended to interfere with ongoing litigation of enforcement actions which bring into issue PCB spills cleanup.

(ii) EPA recognizes that old spills which are discovered after the effective date of this policy will require site-by-site evaluation because of the likelihood that the site involves more pervasive PCB contamination than fresh spills and because old spills are generally more difficult to clean up than fresh spills (particularly on porous surfaces such as concrete). Therefore, spills which occurred before the effective date of this policy are to be decontaminated to requirements established at the discretion of EPA, usually through its regional offices.

(2) EPA expects most PCB spills subject to the TSCA PCB regulations to conform to the typical spill situations considered in developing this policy. This policy does, however, exclude from application of the final numerical cleanup standards certain spill situations from its scope: Spills directly into surface waters, drinking water, sewers, grazing lands, and vegetable gardens. These types of spills are subject to final cleanup standards to be established at the discretion of the regional office. These spills are, however, subject to the immediate notification requirements and measures to minimize further environmental contamination.

(3) For all other spills, EPA generally expects the decontamination standards of this policy to apply. Occasionally, some small percentage of spills covered by this policy may warrant more stringent cleanup requirements because of additional routes of exposure or significantly greater exposures than those assumed in developing the final cleanup standards of this policy. While the EPA regional offices have the authority to require additional cleanup in these circumstances, the Regional Administrator must first make a finding based on the specific facts of a spill that additional cleanup must occur to prevent unreasonable risk. In addition, before a final decision is made to require additional cleanup, the Regional Administrator must notify the Director, Office of Toxic Substances at Headquarters of his/her finding and the basis for the finding.

(4) There may also be exceptional spill situations that requires less stringent cleanup or a different approach to cleanup because of factors associated with the particular spill. These factors may mitigate expected exposures and risks or make cleanup to these requirements impracticable.

(b) *Spills that may require more stringent cleanup levels.* For spills within the scope of this policy, EPA generally retains, under § 761.135, the authority to require additional cleanup upon finding that, despite good faith efforts by the responsible party, the numerical decontamination levels in the policy have not been met. In addition, EPA foresees the possibility of exceptional spill situations in which site-specific risk factors may warrant additional cleanup to more stringent numerical decontamination levels than are required by the policy. In these situations, the Regional Administrator has the authority to require cleanup to levels lower than those included in this policy upon finding that further cleanup must occur to prevent unreasonable risk. The Regional Administrator will consult with the Director, Office of Toxic Substances, prior to making such a finding.

(1) For example, site-specific characteristics, such as short depth to ground water, type of soil, or the presence of a shallow well, may pose exceptionally high potential for ground water contamination by PCBs remaining after cleanup to the standards specified in this policy. Spills that pose such a high degree of potential for ground water contamination have not been excluded from the policy under paragraph (d) of this section because the presence of such potential may not be readily apparent. EPA feels that automatically excluding such spills from the scope of the policy could result in the delay of cleanup—a particularly undesirable outcome if potential ground water contamination is, in fact, a significant concern.

(2) In those situations, the Regional Administrator may require cleanup in addition to that required under § 761.125 (b) and (c). However, the Regional Administrator must first make a finding, based on the specific facts of a spill, that additional cleanup is necessary to prevent unreasonable risk. In addition, before making a final decision on additional cleanup, the Regional Administrator must notify the Director of the Office of Toxic Substances of his finding and the basis for the finding.

(c) *Flexibility to allow less stringent or alternative requirements.* EPA retains the flexibility to allow less stringent or alternative decontamination measures based upon site-specific considerations. EPA will exercise this flexibility if the responsible party demonstrates that cleanup to the numerical decontamination levels is clearly unwarranted because of risk-mitigating factors, that compliance with the procedural requirements or numerical standards in the policy is impracticable at a particular site, or that site-specific characteristics make the costs of cleanup prohibitive. The Regional Administrator will notify the Director of OTS of any decision and the basis for the decision to allow less stringent cleanup. The purpose of this notification is to enable the Director of OTS to ensure consistency of spill cleanup standards under special circumstances across the regions.

(d) *Excluded spills.* (1) Although the spill situations in paragraphs (d)(2) (i) through (vi) of this section are excluded from the automatic application of final decontamination standards under § 761.125 (b) and (c), the general requirements under § 761.125(a) do apply to these spills. In addition, all of these excluded situations require practicable, immediate actions to contain the area of contamination. While these situations may not always require more stringent cleanup measures, the Agency is excluding these scenarios because they will always involve significant factors that may not be adequately addressed by cleanup standards based upon typical spill characteristics.

(2) For the spill situations in paragraphs (d)(2)(i) through (vi) of this section, the responsible party shall decontaminate the spill in accordance with site-specific requirements established by the EPA regional offices.

(i) Spills that result in the direct contamination of surface waters (surface waters include, but are not limited to, "waters of the United States" as defined in Part 122 of this chapter, ponds, lagoons, wetlands, and storage reservoirs).

(ii) Spills that result in the direct contamination of sewers or sewage treatment systems.

(iii) Spills that result in the direct contamination of any private or public drinking water sources or distribution systems.

(iv) Spills which migrate to and contaminate surface waters, sewers, or drinking water supplies before cleanup has been completed in accordance with this policy.

(v) Spills that contaminate animal grazing lands.

(vi) Spills that contaminate vegetable gradens.

(e) *Relationship of policy to other statutes.* (1) This policy does not affect cleanup standards or requirements for the reporting of spills imposed, or to be imposed, under other Federal statutory authorities, including but not limited to, the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). Where more than one requirement applies, the stricter standard must be met.

(2) The Agency recognizes that the existence of this policy will inevitably result in attempts to apply the standards to situations within the scope of other statutory authorities. However, other statutes require the Agency to consider different or alternative factors in determining appropriate corrective actions. In addition, the types and magnitudes of exposures associated with sites requiring corrective action under other statutes often involve important differences from those expected of the typical, electrical equipment-type spills considered in developing this policy. Thus, cleanups under other statutes, such as RCRA corrective actions or remedial and response actions under SARA may result in different outcomes.

§ 761.123 Definitions.

For purposes of this policy, certain words and phrases are used to denote specific materials, procedures, or circumstances. The following definitions are provided for purposes of clarity and are not to be taken as exhaustive lists of situations and materials covered by the policy.

"Double wash/rinse" means a minimum requirement to cleanse solid surfaces (both impervious and nonimpervious) two times with an appropriate solvent or other material in which PCBs are at least 5 percent soluble (by weight). A volume of PCB-free fluid sufficient to cover the contaminated surface completely must be used in each wash/rinse. The wash/rinse requirement does not mean the mere spreading of solvent or other fluid over the surface, nor does the requirement mean a once-over wipe with a soaked cloth. Precautions must be taken to contain any runoff resulting from the cleansing and to dispose properly of wastes generated during the cleansing.

"High-concentration PCBs" means PCBs that contain 500 ppm or greater PCBs, or those materials which EPA requires to be assumed to contain 500 ppm or greater PCBs in the absence of testing.

"High-contact industrial surface" means a surface in an industrial setting which is repeatedly touched, often for relatively long periods of time. Manned machinery and control panels are examples of high-contact industrial surfaces. High-contact industrial surfaces are generally of impervious solid material. Examples of low-contact industrial surfaces include ceilings, walls, floors, roofs, roadways and sidewalks in the industrial area, utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components, indoor vaults, and pipes.

"High-contact residential/commercial surface" means a surface in a residential/commercial area which is repeatedly touched, often for relatively long periods of time. Doors, wall areas below 6 feet in height, uncovered flooring, windowsills, fencing, bannisters, stairs, automobiles, and children's play areas such as outdoor patios and sidewalks are examples of high-contact residential/commercial surfaces. Examples of low-contact residential/commercial surfaces include interior ceilings, interior wall areas above 6 feet in height, roofs, asphalt roadways, concrete roadways, wooden utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components (e.g., aluminum/vinyl siding, cinder block, asphalt tiles), and pipes.

"Impervious solid surfaces" means solid surfaces which are nonporous and thus unlikely to absorb spilled PCBs within the short period of time required for cleanup of spills under this policy. Impervious solid surfaces include, but are not limited to, metals, glass, aluminum siding, and enameled or laminated surfaces.

"Low-concentration PCBs" means PCBs that are tested and found to contain less than 500 ppm PCBs, or those PCB-containing materials which EPA requires to be assumed to be at concentrations below 500 ppm (i.e., untested mineral oil dielectric fluid).

"Nonimpervious solid surfaces" means solid surfaces which are porous and are more likely to absorb spilled PCBs prior to completion of the cleanup requirements prescribed in this policy. Nonimpervious solid surfaces include, but are not limited to, wood, concrete, asphalt, and plasterboard.

"Nonrestricted access areas" means any area other than restricted access, outdoor electrical substations, and other restricted access locations, as defined in this section. In addition to residential/commercial areas, these areas include unrestricted access rural areas (areas of low density development and population where access is uncontrolled by either man-made barriers or naturally occurring barriers, such as rough terrain, mountains, or cliffs).

"Other restricted access (nonsubstation) locations" means areas other than electrical substations that are at least 0.1 kilometer (km) from a residential/commercial area and limited by man-made barriers (e.g., fences and walls) to substantially limited by naturally occurring barriers such as mountains, cliffs, or rough terrain. These areas generally include industrial facilities and extremely remote rural locations. (Areas where access is restricted but are less than 0.1 km from a residential/commercial area are considered to be residential/commercial areas.)

"Outdoor electrical substations" means outdoor, fenced-off, and restricted access areas used in the transmission and/or distribution of electrical power Outdoor electrical substations restrict public access by being fenced or walled off as defined under § 761.30(1)(1)(ii). For purposes of this TSCA policy, outdoor electrical substations are defined as being located at least 0.1 km from a residential/commercial area. Outdoor fenced-off and restricted access areas used in the transmission and/or distribution of electrical power which are located less than 0.1. km from a residential/commercial area are considered to be residential/commercial areas.

"PCBs" means polychlorinated biphenyls as defined under § 761.3. As specified under § 761.1(b), no requirements may be avoided through dilution of the PCB concentration.

"Requirements and standards" means:

(1) "Requirements" as used in this policy refers to both the procedural responses and numerical decontamination levels set forth in this policy as constituting adequate cleanup of PCBs.

(2) "Standards" refers to the numerical decontamination levels set forth in this policy.

"Residential/commercial areas" means those areas where people live or reside, or where people work in other than manufacturing or farming industries. Residential areas include housing and the property on which housing is located, as well as playgrounds, roadways, sidewalks, parks, and other similar areas within a residential community. Commercial areas are typically accessible to both members of the general public and employees and include public assembly properties, institutional properties, stores, office buildings, and transportation centers.

"Responsible party means the owner of the PCB equipment, facility, or other source of PCBs or his/her designated agent (e.g., a facility manager or foreman).

"Soil" means all vegetation, soils and other ground media, including but not limited to, sand, grass , gravel, and oyster shells. It does not include concrete and asphalt.

"Spill" means both intentional and unintentional spills, leaks, and other uncontrolled discharges where the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases. This policy applies to spills of 50 ppm or greater PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled as opposed to the concentration of PCBs in the material onto which the PCBs were spilled. Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm, but less than 500 ppm PCBs and is subject to the relevant requirements of this policy.

"Spill area" means the area of soil on which visible traces of the spill can be observed plus a buffer zone of 1 foot beyond the visible traces. Any surface or object (e.g., concrete sidewalk or automobile) within the visible traces area or on which visible traces of the spilled material are observed is included in the spill area. This area represents the minimum area assumed to be contaminated by PCBs in the absence of precleanup sampling data and is thus the minimum area which must be cleaned.

"Spill boundaries" means the actual area of contamination as determined by postcleanup verification sampling or by precleanup sampling to determine actual spill boundaries. EPA can require additional cleanup when necessary to decontaminate all areas within the spill boundaries to the levels required in this policy (e.g., additional cleanup will be required if postcleanup sampling indicates that the area decontaminated by the responsible party, such as the spill area as defined in this section, did not encompass the actual boundaries of PCB concentration).

"Standard wipe test" means, for spills of high-concentration PCBs on solid surfaces, a cleanup to numerical surface standards and sampling by a standard wipe test to verify that the numerical standards have been met. This definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard-size template (10 centimeters (cm) x 10 cm) will be used to delineate the area of cleanup; the wiping medium will be a gauze pad or glass wool of known size which has been saturated with hexane. It is important that the wipe be performed very quickly after the hexane is exposed to air. EPA strongly recommends that the gauze (or glass wool) be prepared with hexane in the laboratory and that the wiping medium be stored in sealed glass vials until it is used for the wipe test. Further, EPA requires the collection and testing of field blanks and replicates.

§ 761.125 Requirements for PCB spill cleanup.

(a) *General.* Unless expressly limited, the reporting, disposal, and precleanup sampling requirements in paragraphs (a) (1) through (3) of this section apply to all spills of PCBs at concentrations of 50 ppm or greater which are subject to decontamination requirements under TSCA, including those spills listed under § 761.120(b) which are excluded from the cleanup standards at paragraphs (b) and (c) of this section.

(1) *Reporting requirements.* The reporting in paragraph (a)(1) (i) through (iv) of this section is required in addition to applicable reporting requirements under the Clean Water Act (CWA) or the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA). For example, under the National Contingency Plan all spills involving 10 pounds or more of PCB material must currently be reported to the National Response Center (1-800-424-8802). The requirements in paragraphs (a)(1) (i) through (iv) of this section are designed to be consistent with existing reporting requirements to the extent possible so as to minimize reporting burdens on governments as well as the regulated community.

(i) Where a spill directly contaminates surface water, sewers, or drinking water supplies, as discussed under § 761.120(d), the responsible party shall notify the appropriate EPA regional office (the Office of Pesticides and Toxic Substances Branch) and obtain guidance for appropriate cleanup measures in the shortest possible time after discovery, but in no case later than 24 hours after discovery.

(ii) Where a spill directly contaminates grazing lands or vegetable gardens, as discussed under § 761.120(d), the responsible party shall notify the appropriate EPA regional office (the Office of Pesticides and Toxic Substances Branch) and proceed with the immediate requirements specified under paragraph (b) or (c) of this section, depending on the source of the spill, in the shortest possible time after discovery, but in no case later than 24 hours after discovery.

(iii) Where a spill exceeds 10 pounds of PCB material (generally 1 gallon of PCB dielectric fluid) and is not addressed in paragraph (a)(1) (i) or (ii) of this section, the responsible party will notify the appropriate EPA regional office and proceed to decontaminate the spill area in accordance with this TSCA policy in the shortest possible time after discovery, but in no case later than 24 hours after discovery. For purposes of the notification requirement, the 10 pounds are measured by the weight of the PCB-containing material spilled rather than by the weight of only the PCBs spilled.

(iv) Spills of 10 pounds or less, which are not addressed in paragraph (a)(1) (i) or (ii) of this section, must be cleaned up in accordance with this policy (in order to avoid EPA enforcement liability), but notification of EPA is not required.

(2) *Disposal of cleanup debris and materials.* All concentrated soils, solvents, rags, and other materials resulting from the cleanup of PCBs under this policy shall be properly stored, labeled, and disposed of in accordance with the provisions of § 761.60.

(3) *Determination of spill boundaries in the absence of visible traces.* For spills where there are insufficient visible traces yet there is evidence of a leak or spill, the boundaries of the spill are to be determined by using a statistically based sampling scheme.

(b) *Requirements for cleanup of low-concentration spills which involve less than 1 pound of PCBs by weight (less than 270 gallons of untested mineral oil)*—(1) *Decontamination requirements.* Spills of less than 270 gallons of untested mineral oil, low-concentration PCBs, as defined under § 761.123, which involve less than 1 pound of PCBs by weight (e.g., less than 270 gallons of untested mineral oil containing less than 500 ppm PCBs) shall be cleaned in the following manner:

(i) Solid surfaces must be double washed/rinsed (as defined under § 761.123); except that all indoor, residential surfaces other than vault areas must be cleaned to 10 micrograms per 100 square centimeters (10 $\mu g/100\ cm^2$) by standard commercial wipe tests.

(ii) All soil within the spill area (i.e., visible traces of soil and a buffer of 1 lateral foot around the visible traces) must be excavated, and the ground be restored to its original configuration by back-filling with clean soil (i.e., containing less than 1 ppm PCBs).

(iii) Requirements of paragraph (b)(1) (i) and (ii) of this section must be completed within 48 hours after the responsible party was notified or became aware of the spill.

(2) *Effect of emergency or adverse weather.* Completion of cleanup may be delayed beyond 48 hours in case of circumstances including but not limited to, civil emergency, adverse weather conditions, lack of access to the site, and emergency operating conditions. The occurrence of a spill on a weekend or overtime costs are not acceptable reasons to delay response. Completion of cleanup may be delayed only for the duration of the adverse conditions. If the adverse weather conditions, or time lapse due to other emergency, has left insufficient visible traces, the responsible party must use a statistically based sampling scheme to determine the spill boundaries as required under paragraph (a)(3) of this section.

(3) *Records and certification.* At the completion of cleanup, the responsible party shall document the cleanup with records and certification of decontamination. The records and certification must be maintained for a period of 5 years. The records and certification shall consist of the following:

(i) Identification of the source of the spill (e.g., type of equipment).

(ii) Estimated or actual date and time of the spill occurrence.

(iii) The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

(iv) A brief description of the spill location.

(v) Precleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces, and a brief description of the sampling methodology used to establish the spill boundaries.

(vi) A brief description of the solid surfaces cleaned and of the double wash/rinse method used.

(vii) Approximate depth of soil excavation and the amount of soil removed.

(viii) A certification statement signed by the responsible party stating that the cleanup requirements have been met and that the information contained in the record is true to the best of his/her knowledge.

(ix) While not required for compliance with this policy, the following information would be useful if maintained in the records:

(A) Additional pre- or post-cleanup sampling.

(B) The estimated cost of the cleanup by man-hours, dollars, or both.

(C) *Requirements for cleanup of high-concentration spills and low-concentration spills involving 1 pound or more PCBs by weight (270 gallons or more of untested mineral oil).* Cleanup of low-concentration spills involving 1 lb or more PCBs by weight and of all spills of materials other than low-concentration materials shall be considered complete if all of the immediate requirements, cleanup standards, sampling, and recordkeeping requirements of paragraphs (c) (1) through (5) of this section are met.

(1) *Immediate requirements.* The four actions in paragraphs (c)(1) (i) through (iv) of this section must be taken as quickly as possible and within no more than 24 hours (or within 48 hours for PCB Transformers) after the responsible party was notified or became aware of the spill, except that actions described in paragraphs (c)(1) (ii) through (iv) of this section can be delayed beyond 24 hours if circumstances (e.g., civil emergency, hurricane, tornado, or other similar adverse weather conditions, lack of access due to physical impossibility, or emergency operating conditions) so require for the duration of the adverse conditions. The occurrence of a spill on a weekend or overtime costs are not acceptable reasons to delay response. Owners of spilled PCBs who have delayed cleanup because of these types of circumstances must keep records documenting the fact that circumstances precluded rapid response.

(i) The responsible party shall notify the EPA regional office and the NRC as required by § 761.125(a)(1) or by other applicable statutes.

(ii) The responsible party shall effectively cordon off or otherwise delineate and restrict an area encompassing any visible traces plus a 3-foot buffer and place clearly visible signs advising persons to avoid the area to minimize the spread of contamination as well as the potential for human exposure.

(iii) The responsible party shall record and document the area of visible contamination, noting the extent of the visible trace areas and the center of the visible trace area. If there are no visible traces, the responsible party shall record this fact and contact the regional office of the EPA for guidance in completing statistical sampling of the spill area to establish spill boundaries.

(iv) The responsible party shall initiate cleanup of all visible traces of the fluid on hard surfaces and initiate removal of all visible traces of the spill on soil and other media, such as gravel, sand, oyster shells, etc.

(v) If there has been a delay in reaching the site and there are insufficient visible traces of PCBs remaining at the spill site, the responsible party must estimate (based on the amount of material missing from the equipment or container) the area of the spill and immediately cordon off the area of suspect contaimination. The responsible party must then utilize a statistically based sampling scheme to identify the boundaries of the spill area as soon as practicable.

(vi) Although this policy requires certain immediate actions, as described in paragraphs (c)(1)(i) through (iv) of this section, EPA is not placing a time limit on completion of the cleanup effort since the time required for completion will vary from case to case. However, EPA expects that decontamination will be achieved promptly in all cases and will consider promptness of completion in determining whether the responsible party made good faith efforts to clean up in accordance with this policy.

(2) *Requirements for decontaminating spills in outdoor electrical substations.* Spills which occur in outdoor electrical substations, as defined under § 761.123, shall be decontaminated in accordance with paragraphs (c)(2)(i) and (ii) of this section. Conformance to the cleanup standards under paragraphs (c)(2)(i) and (ii) of this section shall be verified by post-cleanup sampling as specified under § 761.130. At such times as outdoor electrical substations are converted to another use, the spill site shall be cleaned up to the nonrestricted access requirements under paragraph (c)(4) of this section.

(i) Contaminated solid surfaces (both impervious and non-impervious) shall be cleaned to a PCB concentration of 100 micrograms (μg)/100 square centimeters (cm^2) (as measured by standard wipe tests).

(ii) At the option of the responsible party, soil contaminated by the spill will be cleaned either to 25 ppm PCBs by weight, or to 50 ppm PCBs by weight provided that a label or notice is visibly placed in the area. Upon demonstration by the responsible party that cleanup to 25 ppm or 50 ppm will jeopardize the integrity of the electrical equipment at the substation, the EPA regional office may establish an alternative cleanup method or level and place the responsible party on a reasonably timely schedule for completion of cleanup.

(3) *Requirements for decontaminating spills in other restricted access areas.* Spills which occur in restricted access locations other than outdoor electrical substations, as defined under § 761.123, shall be decontaminated in accordance with paragraph (c)(3)(i) through (v) of this section. Conformance to the cleanup standards in paragraph (c)(3)(i) through (v) of this section shall be verified by postcleanup sampling as specified under § 761.130. At such times as restricted access areas other than outdoor electrical substations are converted to another use, the spill site shall be cleaned up to the nonrestricted access area requirements of paragraph (c)(4) of this section.

(i) High-contact solid surfaces, as defined under § 761.163 shall be cleaned to 10 $\mu g/100\ cm^2$ (as measured by standard wipe tests).

(ii) Low-contact, indoor, impervious solid surfaces will be decontaminated to 10 $\mu g/100\ cm^2$.

(iii) At the option of the responsible party, low-contact, indoor, nonimpervious surfaces will be cleaned either to 10 $\mu g/100\ cm^2$ or to 100 $\mu g/100\ cm^2$ and encapsulated. The Regional Administrator, however, retains the authority to disallow the encapsulation option for a particular spill situation upon finding that the uncertainties associated with that option pose special concerns at that site. That is, the Regional Administrator would not permit encapsulation if he/she determined that if the encapsulation failed the failure would create an imminent hazard at the site.

(iv) Low-contact, outdoor surfaces (both impervious and nonimpervious) shall be cleaned to 100 $\mu g/100\ cm^2$.

(v) Soil contaminated by the spill will be cleaned to 25 ppm PCBs by weight.

(4) *Requirements for decontaminating spills in nonrestricted access areas.* Spills which occur in nonrestricted access locations, as defined under § 761.123, shall be decontaminated in accordance with paragraphs (c)(4)(i) through (v) of this section. Conformance to the cleanup standards at paragraphs (c)(4)(i) through (v) of this section shall be verified by postcleanup sampling as specified under § 761.130.

(i) Furnishings, toys, and other easily replaceable household items shall be disposed of in accordance with the provisions of § 761.60 and replaced by the responsible party.

(ii) Indoor solid surfaces and high-contact outdoor solid surfaces, defined as high contact residential/commercial surfaces under § 761.123, shall be cleaned to 10 $\mu g/100\ cm^2$ (as measured by standard wipe tests).

(iii) Indoor vault areas and low-contact, outdoor, impervious solid surfaces shall be decontaminated to 10 $\mu g/100\ cm^2$.

(iv) At the option of the responsible party, low-contact, outdoor, nonimpervious solid surfaces shall be either cleaned to 10 $\mu g/100\ cm^2$ or cleaned to 100 $\mu g/100\ cm^2$ and encapsulated. The Regional Administrator, however, retains the authority to disallow the encapsulation option for a particular spill situation upon finding that the uncertainties associated with that option pose special concerns at that site. That is, the Regional Administrator would not permit encapsulation if he/she determined that if the encapsulation failed the failure would create an imminent hazard at the site.

(v) Soil contaminated by the spill will be decontaminated to 10 ppm PCBs by weight provided that soil is excavated to a minimum depth of 10 inches. The excavated soil will be replaced with clean soil, i.e., containing less than 1 ppm PCBs, and the spill site will be restored (e.g., replacement of turf).

(5) *Records.* The responsible party shall document the cleanup with records of decontamination. The records must be maintained for a period of 5 years. The records and certification shall consist of the following:

(i) Identification of the source of the spill, e.g., type of equipment.

(ii) Estimated or actual date and time of the spill occurrence.

(iii) The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

(iv) A brief description of the spill location and the nature of the materials contaminated. This information should include whether the spill occurred in an outdoor electrical substation, other restricted access location, or in a nonrestricted access area.

(v) Precleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces and a brief description of the sampling methodology used to establish the spill boundaries.

(vi) A brief description of the solid surfaces cleaned.

(vii) Approximate depth of soil excavation and the amount of soil removed.

(viii) Postcleanup verification sampling data and, if not otherwise apparent from the documentation, a brief description of the sampling methodology and analytical technique used.

(ix) While not required for compliance with this policy, information on the estimated cost of cleanup (by man-hours, dollars, or both) would be useful if maintained in the records.

§ 761.130 Sampling requirements.

Postcleanup sampling is required to verify the level of cleanup under § 761.125(c) (2) through (4). The responsible party may use any statistically valid, reproducible, sampling scheme (either random samples or grid samples) provided that the requirements of paragraphs (a) and (b) of this section are satisfied.

(a) The sampling area is the greater of (1) an area equal to the area cleaned plus an additional 1-foot boundary, or (2) an area 20 percent larger than the original area of contamination.

(b) The sampling scheme must ensure 95 percent confidence against false positives.

(c) The number of samples must be sufficient to ensure that areas of contamination of a radius of 2 feet or more within the sampling area will be detected, except that the minimum number of samples is 3 and the maximum number of samples is 40.

(d) The sampling scheme must include calculation for expected variability due to analytical error.

(e) EPA recommends the use of a sampling scheme developed by the Midwest Research Institute (MRI) for use in EPA enforcement inspections: "Verification of PCB Spill Cleanup by Sampling and Analysis." Guidance for the use of this sampling scheme is available in the MRI report "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup." Both the MRI sampling scheme and the guidance document are available from the TSCA Assistance Office, Environmental Protection Agency, Rm. E-543, 401 M St. SW., Washington, DC 20460 (202-554-1404). The major advantage of this sampling scheme is that it is designed to characterize the degree of contamination within the entire sampling area with a high degree of confidence while using fewer samples than any other grid or random sampling scheme. This sampling scheme also allows some sites to be characterized on the basis of composite samples.

(f) EPA may, at its discretion, take samples from any spill site. If EPA's sampling indicates that the remaining concentration level exceeds the required level, EPA will require further cleanup. For this purpose, the numerical level of cleanup required for spills cleaned in accordance with § 761.125(b) is deemed to be the equivalent of numerical cleanup requirements required for cleanups under § 761.125(c)(2) through (4). Using its best engineering judgment, EPA may sample a statistically valid random or grid sampling technique, or both. When using engineering judgment or random "grab" samples, EPA will take into account that there are limits on the power of a grab sample to dispute statistically based sampling of the type required of the responsible party. EPA headquarters will provide guidance to the EPA regions on the degree of certainty associated with various grab sample results.

§ 761.135 Effect of compliance with this policy and enforcement.

(a) Although a spill of material containing 50 ppm or greater PCBs is considered improper PCB disposal, this policy establishes requirements that EPA considers to be adequate cleanup of the spilled PCBs. Cleanup in accordance with this policy means compliance with the procedural as well as the numerical requirements of this policy. Compliance with this policy creates a presumption against both enforcement action for penalties and the need for further cleanup under TSCA. The Agency reserves the right, however, to initiate appropriate action to compel cleanup where, upon review of the records of cleanup or EPA sampling following cleanup, EPA finds that the decontamination levels in the policy have not been achieved. The Agency also reserves the right to seek penalties where the Agency believes that the responsible party has not made a good faith effort to comply with all provisions of this policy, such as prompt notification of EPA of a spill, recordkeeping, etc.

(b) EPA's exercise of enforcement discretion does not preclude enforcement action under other provisions of TSCA or any other Federal statute. This includes, even in cases where the numerical decontamination levels set forth in this policy have been met, civil or criminal action for penalties where EPA believes the spill to have been the result of gross negligence or knowing violation.

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APPENDIX E

SURFACE IMPOUNDMENT
POST-CLOSURE GROUNDWATER MONITORING PLAN

WORK PLAN

SURFACE IMPOUNDMENT
POST CLOSURE GROUND WATER MONITORING PLAN

GENERAL MOTORS CORPORATION
FISHER GUIDE DIVISION
SYRACUSE, NEW YORK

APRIL, 1988

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SECTION 1 - INTRODUCTION

1.01 Project Background

The General Motors Corporation, Fisher Guide Division, is located in Syracuse, New York (Figure 1) and is engaged in the manufacturing of plastic automotive accessories. The plant operates a wastewater treatment facility and all process wastewater from plant operations is discharged to this facility.

There are two surface impoundments at the GMC-Fisher Guide facility and they are located to the north of the manufacturing building as shown on Figure 2. Impoundment No. 1 was constructed in 1963 and received treated effluent from the wastewater treatment facility and stormwater runoff from paved areas. Impoundment No. 2 was constructed in 1979 and it was designed to collect stormwater runoff and capture free oil from the stormwater runoff.

The GMC-Fisher Guide facility will be closing the two surface impoundments in accordance with New York State Department of Environmental Conservation standards (6 NYCRR 373-3.11f(3)). As part of the Closure standards, the facility is required to develop a post-closure ground water monitoring plan. The purposes of the ground water monitoring program is to evaluate the ground water quality in the vicinity of the closed surface impoundments. This document describes the various components of the proposed ground water monitoring program including: well locations, well specifications, sampling procedures, analytical requirements and data evaluation procedures. The other aspects of the closure plan are addressed elsewhere in a separate document to which this is an attachment.

1.02 Hydrogeologic Conditions

A hydrogeologic investigation was conducted at The GMC Fisher Guide facility by EDI Engineering and Science in 1985. The locations of existing wells previously installed in the vicinity of the surface impoundments are shown on Figure 2. Boring logs and wells specifications for these wells are included in Appendix A.

The previous investigations (EDI, 1985) have revealed the subsurface geology at the GM site is characterized by unconsolidated glacial lacustrine and till deposits overlying shale and siltstone bedrock. In the vicinity of the surface impoundments, at Well W-5D, the unconsolidated deposits consist of approximately 5 feet of fill overlying lacustrine deposits of silt and fine sand that extend to a depth of 28 feet. Below this depth, the unconsolidated deposits consist of a dense glacial till at least five feet thick. The entire thickness of the till or the depth to bedrock was not determined at the well locations.

In the vicinity of the surface impoundments, ground water occurs at a depth of five to seven feet. A ground water elevation map (Figure 3) illustrates that localized ground water flow in the vicinity of the impoundments is in a northeast direction. In situ permeability test data (EDI, 1985) indicates the subsurface lacustrine sediments have a permeability ranging from 4.6×10^{-4} cm/sec to 1.5×10^{-5} cm/sec.

SECTION 2 - POST CLOSURE GROUND WATER MONITORING PLAN

2.01 Well Locations

In accordance with the ground water monitoring requirements of the NYSDEC (6 NYCRR 373-3.6(h)), it is proposed that the ground water monitoring program include the installation of up to 10 additional monitoring wells, at five locations; in two upgradient and three down-gradient locations near impoundments No. 1 and No. 2. The proposed locations of these wells are shown in Figure 3.

The total number of wells to be installed will depend on the site specific subsurface conditions identified at each proposed well location during the soil boring program. The geologic conditions identified during previous studies indicate that the uppermost aquifer consists of a lacustrine deposit that extends to a depth of about 28 feet and is underlain by a dense glacial till. Based on this information and in compliance with NYSDEC requests, it is possible that two wells will be installed at each of the five proposed well locations. This decision will be made based on the aquifer thickness observed at the time the soil boring is completed at each respective location. More specifically, in the event that aquifer thickness is determined to be 15 feet or less a single monitoring well will be installed, in lieu of a nested pair, and the well will be screened from the ground water interface to the top of the till layer. If nested well pairs are required they will consist of a shallow well screened at the water table interface, and a deeper well screened immediately above the aquifer/till interface. The wells will be constructed of stainless steel riser pipe and fitted with five foot sections of wire-wound stainless steel well screen.

2.02 Well Specifications

The proposed monitoring wells are to be installed in accordance with the procedures included in Appendix B. The drilling will be performed using hollow stem auger drilling techniques. During the drilling soil samples will be collected at five feet intervals using split barrel sampling procedures (ASTM Method 1586-D). Well construction will consist of a 2-inch diameter stainless steel well screen, attached to a stainless steel riser casing. Screen lengths will be determined subsequent to identifying the thickness of the aquifer at each of the proposed monitoring well locations, as described in Section 2.01. The annular space around the well screen will be packed with a silica sand and the annular space above the sand pack will be sealed with a cement/bentonite grout. The detailed specifications of the proposed wells are included in Appendix B.

2.03 Analytical Requirements

Ground water samples collected from the monitoring wells located in the vicinity of the surface impoundments during 1985 were analyzed for priority pollutants. The priority pollutant analyses detected the following compounds: vinyl chloride, trans-1,2-dichloroethylene, methylene chloride, toluene, nickel, zinc, and chromium. No acid extractable, base-neutral or pesticide compounds were detected within the ground water in the vicinity of the surface impoundments. The existing data are presented in Appendix C. Based on these previous analyses the detected compounds identified above as well as PCBs (that has been detected within the on-site soils), BTX, and priority pollutant metals will be analyzed from the newly installed ground water monitoring wells during the initial sampling event. In addition, during the initial sampling event, one upgradient and one downgradient well will be designated as compliance monitoring wells, and sampled for Appendix 23 constituents as identified in 6 NYCRR part 371. If any additional parameters are identified, it may be necessary to modify the standard list of parameters for routine analysis.

2.04 Monitoring Frequency

GMC-Fisher Guide will conduct an accelerated monitoring program which will entail the sampling of the two previously designated compliance wells on a monthly basis, for six consecutive months. The purpose of this accelerated program is to establish an adequate set of baseline ground water quality data to be used in subsequent comparative statistical analyses required in RCRA. Four replicate samples will be collected from the two designated compliance wells each month during the accelerated program (i.e. six months). Samples collected during the accelerated monitoring program will be analyzed for the parameters identified in Section 2.03.

Following the closure of the impoundments, ground water samples will be collected from the newly installed wells on a quarterly basis (4 events per year) for a period of up to five years, following the closure of the impoundments. Quarterly ground water samples will also be analyzed for the parameters identified in 2.03. If during the five year period, there is no significant increase in the concentrations relative to background concentrations for any constituents monitored, a request will be made to the NYSDEC to modify the monitoring frequency and/or list of parameters for the remainder of the post closure period.

SECTION 3 - GROUND WATER SAMPLING AND ANALYSES

3.01 Ground Water Sample Collection

Ground water samples will be collected from the newly installed monitoring wells on a quarterly basis in accordance with the procedures described in Appendix D and briefly outlined below. Prior to collecting a ground water sample, the standing water within the well and filter pack will be evacuated by removing at least three well volumes of water from the well using either a centrifugal or submersible pump. Before well evacuation, the water level within each well will be measured to the nearest 0.01 feet. Following well evacuations, the well will be allowed to recover until a sufficient volume of water is available for sample collection. All well evacuation equipment will be cleaned after each use to avoid cross-contamination between wells.

Once a sufficient volume of water is available within each ground water monitoring well following well evacuation, a sample will be collected for analysis. The ground water sample will be collected using a stainless steel bailer. The bailer will be cleaned between each sampling location.

3.02 Sample Preservation and Shipment

Following sample collection, the ground water samples will be properly preserved in the field and stored in the appropriate containers. A summary of appropriate sample preservation methods is presented in Table 1. Ground water samples collected for volatile organic analysis will be transferred unfiltered immediately to headspace free, Teflon capped vials. For the first round of the accelerated monitoring program, filtered and unfiltered samples will be collected and analyzed for priority pollutant metals. Subsequently, a decision will be made whether the filtered or unfiltered samples will be used for the remainder of the program. Ground water samples collected for metal analysis will be filtered in the field through a 0.45 micron filter, transferred to a bottle, preserved with nitric acid to a pH less than 2. An additional unfiltered and unpreserved sample will be collected during the accelerated monitoring program. Following sample preservation, the samples will be immediately placed in shipping coolers packed with ice.

3.03 Analytical Procedures

The ground water samples will be analyzed by a laboratory acceptable to the NYSDEC, in accordance with the appropriate EPA approved methods. The analytical methods, maximum holding times and preservation requirements are summarized in Table 1. During sample collection, field blanks and trip blanks will be collected to verify that the sample collection and handing process has not affected the quality of the samples. Trip blanks will consist of one of each bottle type filled in the laboratory with Type II reagent grade water, sealed, and transported on-site, to be handled as a regular sample. Field or equipment blanks will be collected to ensure that non-dedicated sampling devices have been effectively cleaned. The field blank will consist of Type II reagent grade water, placed into the sampling device, then transferred to sample bottles, and returned to the laboratory for analysis. As specified by Leslie Stephenson of the NYSDEC, one trip blank and one field blank will be submitted for laboratory analyses per twenty ground water samples collected or per each sampling event. In addition one duplicate sample will be collected for every ten samples, and one laboratory matrix spike will be submitted per sampling event. These samples will be analyzed for the same parameters as the ground water.

3.04 Chain of Custody

The custody of the ground water samples from the time of field collection through laboratory analysis will be documented with a chain of custody program. This program will be conducted in accordance with the procedures detailed in Appendix D. To provide the documentation needed to trace sample preservation, a chain of custody record will be filled out and accompany the samples. A sample chain of custody record is included in Appendix D and it contains the following information: sample number, data and time of collection, sample type, well identification number, parameters requested for analysis, and signature of person(s) involved in the chain of possession.

SECTION 4 - GROUND WATER DATA ASSESSMENT

4.01 Ground Water Elevation Assessment

The ground water elevations collected during the quarterly ground water sampling program will be summarized on a data base table. In addition, a ground water elevation map will be prepared from the data collected from each quarter. The map will show ground water flow direction and illustrate ground water elevations at a one foot contour interval.

4.02 Ground Water Quality Assessment

Replicate data collected during the accelerated monitoring program, in the two designated compliance monitoring wells will be compiled to determine baseline ground water quality conditions, to be used in subsequent comparative statistical analyses. Students T-Test methods will be used to determine whether statistically significant changes occur in ground water quality as compared with the established baseline data, during subsequent quarterly sampling events.

Statistical analyses will be used to assess the significance of any hazardous constituents, measured above the detectable limit, in ground water samples collected from monitoring wells samples during the quarterly monitoring program. The resultant quarterly volatile organic and inorganic analyses will be compiled into a data base table. These data will be tabulated, for each well, to show statistical parameters including: number of less than detection limit values, total number of values, mean, median, standard deviation, coefficient of variation, minimum value and maximum value. This summary table will be updated on a quarterly basis to evaluate if there are trends showing a significant increase in the concentrations of the parameters monitored.

4.03 Report Submittals

The data from the quarterly monitoring will be compiled on a quarterly basis and will include: tables summarizing ground water elevation data, water quality data, statistical analysis of water quality data, and a map showing ground water elevation contours.

A separate report discussing the results of the accelerated monitoring program will be submitted upon its completion.

Following the analysis of data from the second and fourth quarter of monitoring, an annual hydrogeologic assessment report will be prepared for submittal to the NYSDEC which will include:

- Tables and maps summarizing the data from the quarterly monitoring program.
- As evaluation of the water quality statistical data to identify if there has been a significant increase in concentrations from previous analyses.
- Maps showing ground water elevation contours for each quarterly sampling event.
- Laboratory data sheets including: analytical results, detection limits and QA/QC data.

4.04 Project Schedule

The project schedule is presented as Table 2. This schedule represents an estimate of the time necessary to complete the tasks discussed in the Work Plan, and outlines the temporal sequencing of events to be completed during the first year of monitoring.

Tables

O'BRIEN & GERE

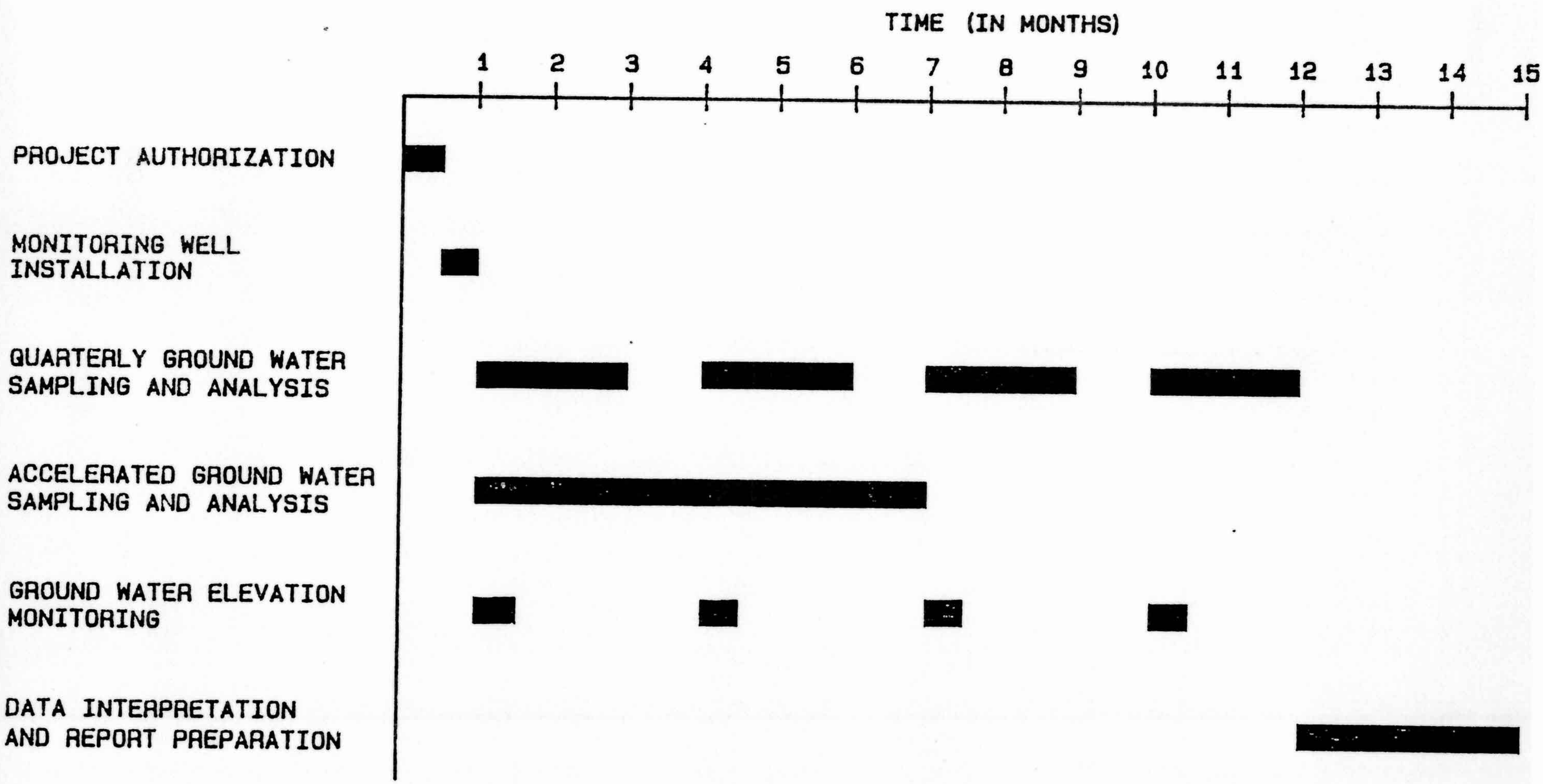
TABLE 1

SAMPLE PRESERVATION AND ANALYTICAL METHODS

Parameter	Preservative	Holding Time	USEPA Method
Priority Pollutant Metals			
(Filtered samples)	Filter on-site HNO_3 to pH2	6 months	200 series
(Unfiltered samples)	Cool to 4°C	6 months	200 series
Volitile Halogenated Organics	Cool to 4°C 40 ml vial w/teflon septum HCl to pH2	14 days	601
BTX	Cool to 4°C 40 ml vial, w/teflon septum HCl to pH2	14 days	602
PCBs	Cool to 4°C pH 5-9	7 days prior to extraction	608

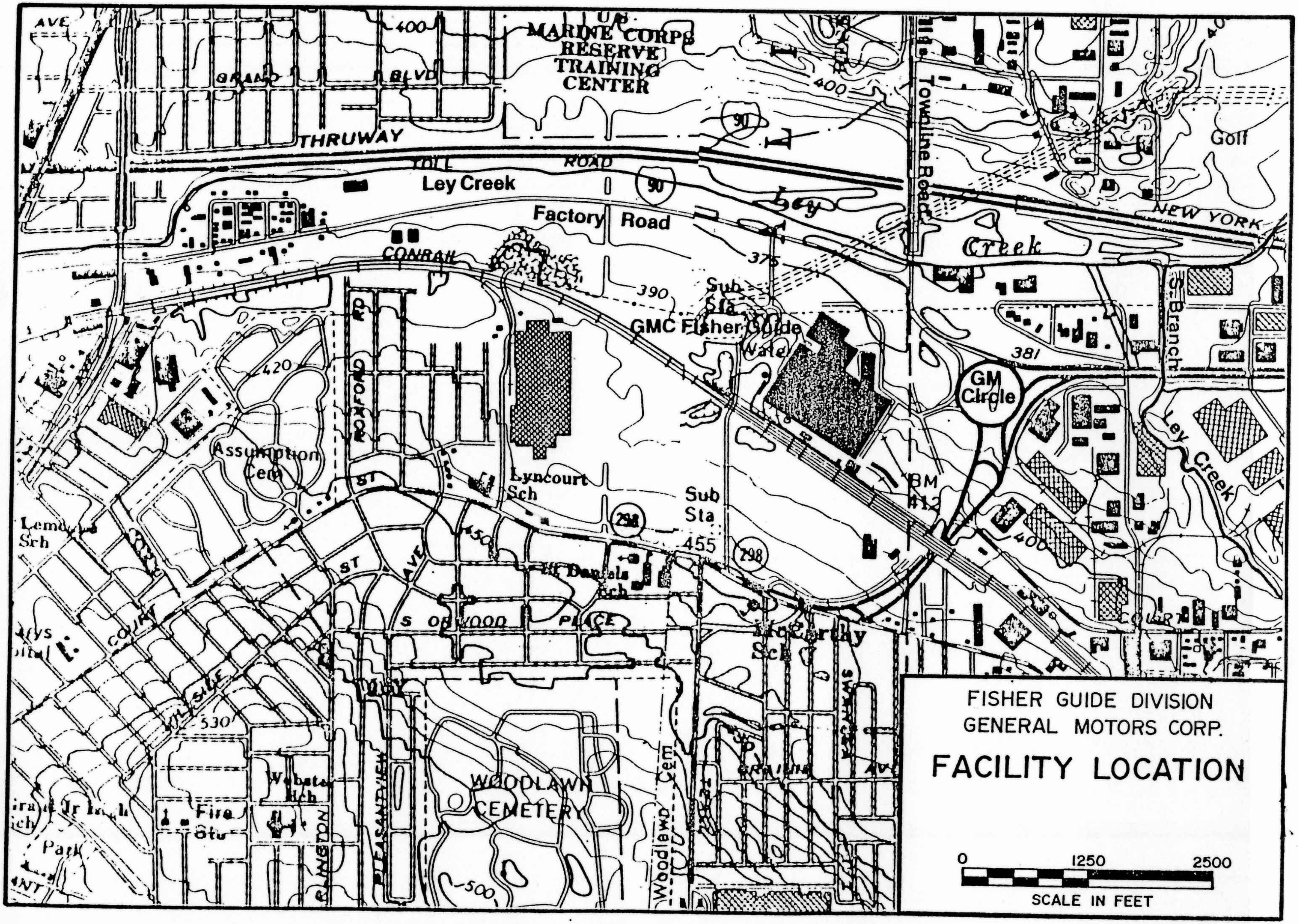
TABLE 2

PROJECT SCHEDULE
SURFACE IMPOUNDMENT
POST CLOSURE MONITORING PLAN



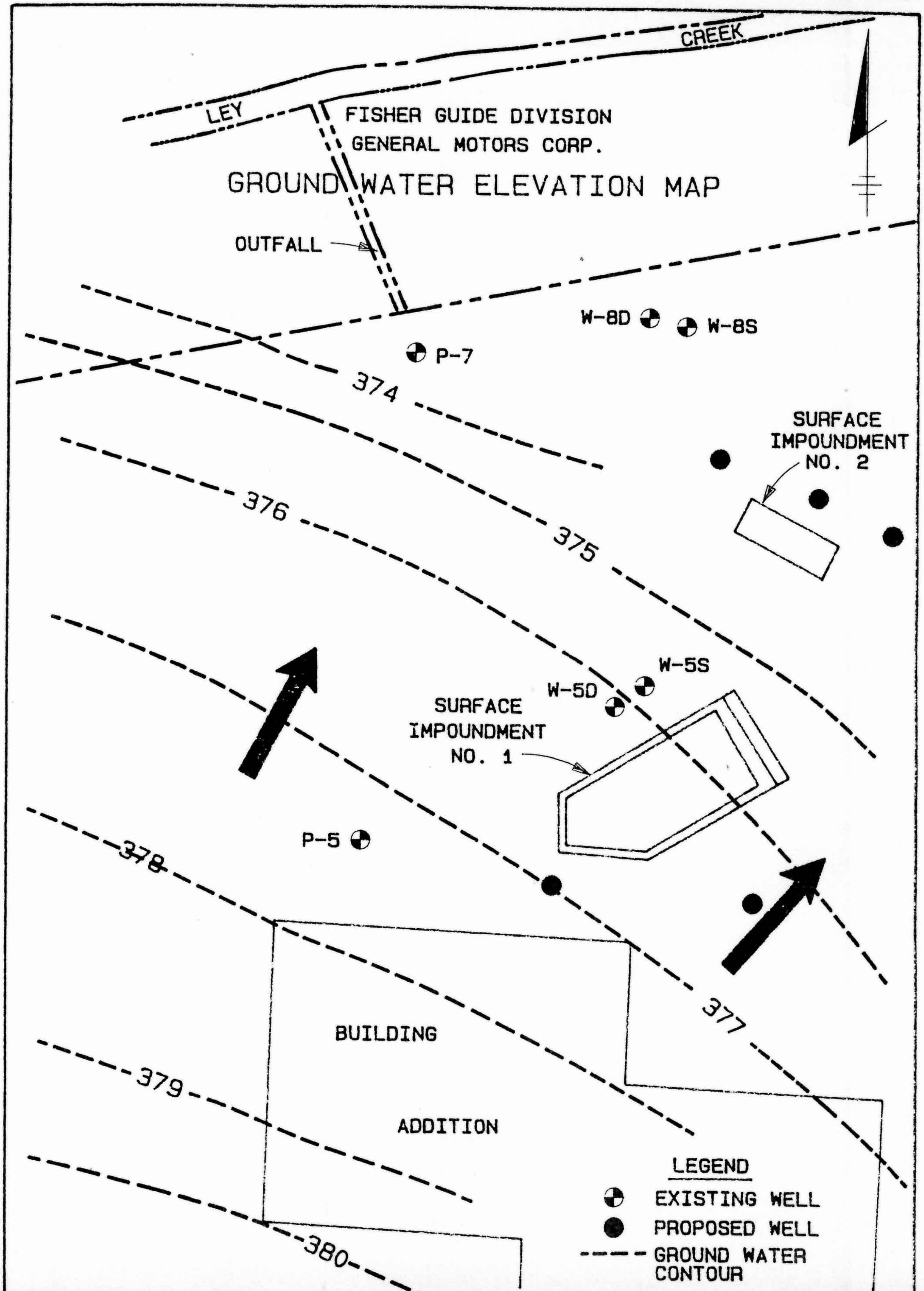
Figures

O'BRIEN & GERE



O'BRIEN & GERE ENGINEERS, INC.

FIGURE 3



GM-010.1.2.3.4

Appendices

O'BRIEN & GERE

APPENDIX A

EXISTING BORING LOGS AND WELL SPECIFICATIONS

HYDROGEOLOGIC LOG

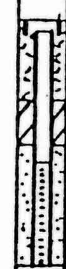
THOMSEN ASSOCIATES

MONITOR NO. W-7S

Sheet 1 of 1

DEPTH	SOIL or ROCK CLASSIFICATION	MONITOR/PIEZOMETER CONSTRUCTION DETAILS — Water Level 6-6	NOTES
0	Augered to 12.0' With No Samples Taken, See W-7D for Soil Classification		
5			
10		8.2	WELL CONSTRUCTION
	Boring Terminated @12.0'		

Columns: DEPTH; ELEVATION; SAMPLES; SAMPLE NO.; CHEM. SMPL.; RECOVERY (Inches); N; SOIL or ROCK CLASSIFICATION; UNIFIED SOIL CLASSIF.; DENSITY (PCF); WATER CONTENT (Percent); PERMEABILITY (cm/sec); MONITOR/PIEZOMETER CONSTRUCTION DETAILS (Water Level); WATER PROBE READINGS: Temp. (°C), Cond. (µmho/cm), Eh (mV), pH; NOTES



WELL CONSTRUCTION

__Well Screen__
stainless steel, 2-inch ø
0.01" slot size
5 feet long, 12' to 7'

__Riser Pipe__
black steel, 2-inch ø
threaded joints with
couplings

__Backfill Material__
4 Q. size silica sand to 6'
bentonite pellet seal 6'
to 4'
cement/bentonite grout 4'
to surface

__Well Completion__
locking cap on riser pipe
curb box cemented over
riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | RQD

Surface Elevation ______
Date Started 5-20-85
Date Completed 5-20-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA- 85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Geologist Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. W-7D

Sheet 1 of 1

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By: Geologist   Checked MR-L

Surface Elevation ______
Date Started 5-22-85
Date Completed 5-24-58
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

NOTE: See key and explanation to log.

DEPTH	SAMPLE NO.	RECOVERY (inches)	N	SOIL or ROCK CLASSIFICATION
0	1	12	34	Brown SILT and fine SAND, little medium-coarse Sand and fine gravel (Fill) (Damp-Firm to Compact)
	2	6	18	
4'				
5	3	12	14	Brown-black SILT, little fine Sand and miscellaneous fill (Fill) (Moist- Firm)
6'	4	12	21	Brown SILT and fine SAND, Some Roots (FILL) (Moist-Firm)
	5	18	8	
10 (10')	6	18	14	Black SILT, Some fine Sand and Organics (Old Topsoil)
11'	7	24	6	Brown fine SAND, Some Silt (Wet-Loose)
14', 15	8	24	4	Brown-gray SILT and CLAY, Some Silt partings, Varved (Wet-Soft)
	ST-1	24		
	9	18	-	grades to SILT and fine SAND
20	10	24	6	grades to fine SAND & SILT
	11	24	3	grades to fine SAND, and Some Silt
25	12	24	-	
	13	24	4	
27.5', 30	14	18	5	Gray fine SAND and SILT, little medium coarse sand
	15	24	5	
32'	16	12	64	Red SILT and fine SAND embedded coarse Sand and fine Gravel, little clay (Till)
35	Run 1	12		
40	Run 2	13		
41.2'				Boring Terminated @ 41.2'

PERMEABILITY (cm/sec): Laboratory 1.4×10^{-7} (at approx. 16'); Field 2.9×10^{-5} (at approx. 26')

MONITOR/PIEZOMETER CONSTRUCTION DETAILS — Water Level: 6-6: 7.5'; 7-2: 7.7'

WATER PROBE READINGS: Temp. (°C) | Cond. (μmhos/cm) | Eh (mV) | pH

NOTES

0.2' Topsoil

Cored Till from 34' to 41.2'
Run #1-34' to 37.6'
Run #2-37.6' to 41.2'

WELL CONSTRUCTION

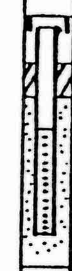
Well Screen
stainless steel, 2-inch ø
0.01" slot size
10 feet long, 32' to 22'

Riser Pipe
black steel, 2-inch ø
threaded joints with couplings

Backfill Material
4 Q. size silica sand to 21'
bentonite pellet seal 21' to 19'
cement/bentonite grout 19' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL	RECOVERY (Inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)	MONITOR/PIEZOMETER CONSTRUCTION DETAILS	WATER PROBE READINGS Temp. (°C)	Cond (µmhos/cm)	Eh (mV)	pH	NOTES
0	381.43						Augered to 12.5' with No Samples Taken, See W-5D for Soil Classificatio					Water Level 6-6: 5.0					
5																	Dark Soil from 6.5 to 7.5 feet
10							Boring Terminated @ 12.5'										



NOTES

Dark Soil from 6.5 to 7.5 feet

Well Construction

Well Screen
stainless steel, 2-inch ø
0.01" slot size
5 feet long 10.5' to 5.5'

Riser Pipe
black steel, 2-inch ø
threaded joints with
couplings

Backfill Material
4 Q. size silica sand to 4.0'
bentonite pellet seal 4.0'
to 2.2'
cement/bentonite grout 2.2
to surface

Well Completion
locking cap on riser pipe
curb box cemented over
riser pipe

NOTE: See key and explanation to log.

RUN NO. | RECOVERY (Percent) | RQD

Surface Elevation 381.43
Date Started 5-17-85
Date Completed 5-17-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow ~~Stem Auger~~

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Driller Checked MR-L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. W-5S

Sheet 1 of 1

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

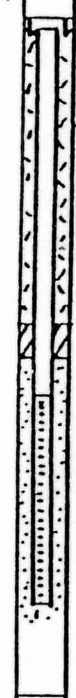
MONITOR NO. W-50

Sheet 1 of 1

Depth	Elevation	Sample No.	Recovery (Inches)	N	Soil or Rock Classification	Permeability (cm/sec)	Notes
0	381.52	1	10	26	Brown-gray fine SAND & SILT, Some cinders (Fill) (Dry-Firm)		
		2	10	10	Brown SILT, Some fine Sand, trace cinders (FILL) (Dry-Firm)		3" Topsoil
5		3	0	12			
		4	12	31	6' Black SILT, Some fine Sand (old Topsoil) 7'		
		5	23	3	Brown fine SAND, little Silt and clay black partings (Moist-Compact) 8'		
10		6	24	5	brown-gray SILT, Some fine Sand, Some Clay, fine sand partings, varved		
		7	24	8	(Wet-Loose) grades to SILT, Some clay, little fine Sand		
15		8	23	3			
		9	24	6	grades to fine SAND, Some Silt, trace clay		
20		10	24	2			
		11	23	3		Field $3.6X10^{-4}$	
		12	24	5			
25		13	24	5			
		14	24	6	26' Red-brown fine SAND, little Silt (Wet-Loose) 28'		
30		15	20	35	Red SILT and fine SAND, Some embedded coarse Sand and fine gravel (TILL) (Wet-Compact)		
		16	14	99	grades to very compact		
					Borings Terminated @ 33'		
35							

Monitor/Piezometer Construction Details

Water Level: 6-6: 5.2; 7-2: 5.3



NOTES

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
10 feet long, 28.3' to 18.3'

Riser Pipe
blacksteel, 2-inch ø
threaded joints with couplings

Backfill Material
4 Q. Size silica sand 16.5'
bentonite pellet seal 16.5 to 15'
cement/bentonite grout 15' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

NOTE: See key and explanation to log.

Surface Elevation 381.52
Date Started 5-16-85
Date Completed 5-16-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York
Classified By Geologist Checked MB L

HYDROGEOLOGIC LOG

THOMSEN ASSOCIATES

MONITOR NO. P-10

Sheet 1 of 1

DEPTH	ELEVATION	SAMPLES	SAMPLE NO.	CHEM. SMPL.	RECOVERY (Inches)	N	SOIL or ROCK CLASSIFICATION	UNIFIED SOIL CLASSIF.	DENSITY (PCF)	WATER CONTENT (Percent)	PERMEABILITY (cm/sec)
0	381.61		1		12	38	Gray-Brown fine-coarse SAND, Some Gravel, little silt (FILL) (Dry-Compact)				
			2		9	31	4.0'				
5			3		6	18	Brown-Black SILT, little fine sand, trace gravel (FILL) (Dry-Firm)				
			4		3	22	8.5'				
10			5		18	14	Brown-fine SAND, little silt, layers of Silt and fine Sand (Wet-Firm) 10.5'				
			6		24	5	Gray-Brown SILT, little clay, partings of fine sand, varved (Wet-Loose)				
			7		24	7	Brown fine SAND, trace silt (Wet-Loose)				
15							Boring Terminated @ 14.0'				

MONITOR/PIEZOMETER CONSTRUCTION DETAILS

Water Level: 6-6

WATER PROBE READINGS

Temp. (°C)	Cond. (µmhos/cm)	Eh (mV)	pH

NOTES

First boring hit pipe at 4', drill rig moved 2'.
Second boring drilled to 10', water level below trench base so boring moved to install well.
Third boring drilled and sampled to 14'. Well could not be installed due to running sand.
Fourth boring drilled to 14' without sampling 2' away from third boring and well installed.

WELL CONSTRUCTION

Well Screen
stainless steel, 2-inch ø
0.01" slot size
5 feet long 14' to 9'

Riser Pipe
black steel, 2-inch ø
threaded joints with couplings

Backfill Material
4Q size silica sand to 8'
bentonite pellet seal 8' - 6'
cement/bentonite grout 6' to surface

Well Completion
locking cap on riser pipe
curb box cemented over riser pipe

RUN NO.	RECOVERY (Percent)	ROD

NOTE: See key and explanation to log.

Surface Elevation 381.61
Date Started 5-14-85
Date Completed 5-14-85
Number of Installations in Boring 1
Method of Installation 4¼" I.D. Hollow Stem Auger

Project No. GTA-85-27
Project Title General Motors Hydrogeologic Investigation
Location Salina, New York

Classified By Geologist Checked MR-I

APPENDIX B

WELL INSTALLATION PROTOCOL

MONITORING WELL INSTALLATION PROTOCOL

I. Drilling/Sampling Procedures

Test borings shall be completed using the hollow stem auger drilling method or rotary drilling method to a depth specified by the supervising geologist/engineer.

If a hollow stem auger drilling method is to be utilized for 2 inch diameter monitoring well completion, the minimum inside diameter of the augers shall be 4 1/4 inches.

Samples of the encountered subsurface materials shall be collected at a minimum of every five (5) feet and/or change in material or at the discretion of the supervising geologist. The sampling method employed shall be ASTM D-1586/Split Barrel Sampling using either a standard 2 foot long 2 inch outside diameter split spoon sampler with a 140 lb. hammer or a 3 inch outside diameter sampler with a 300 lb. hammer. Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labelled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility.

A geologist will be on site during the drilling operations to fully describe each soil sample including 1) Soil type 2) color, 3) percent recovery, 4) moisture content, 5) odor and 6) miscellaneous observations such as organic content. The supervising geologist will be responsible for retaining a representative portion of each sample in a one pint glass jar labelled with 1) site, 2) boring number 3) interval sample/interval preserved, 4) dated, and 5) time of sample collection.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the supervising geologist of changes in drilling pressure, keeping a separate general log of soils encountered including blow counts (i.e. the number of blows from a soil sampling drive weight (140 pounds) required to drive the split spoon sampler in 6-inch increments) and installing monitoring wells to levels directed by the supervising geologist following specifications further outlined in this protocol.

II. Monitoring Well Completion

All monitoring wells will be constructed of 2 inch diameter stainless steel well screen and galvanized riser casing that will extend from the screened interval to 2'-3' above existing grade. Other materials utilized for completion will be washed silica sand (Q-Rock Number 4 or approved equivalent) bentonite grout, Portland Cement and a protective steel locking well casing and cap with locks.

The monitoring well installation method for two 2-inch wells installed within unconsolidated sediments shall be to place the screen and casing assembly into the auger string once the screen interval has been selected. At that time a washed silica sand pack will be placed if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2-3' above the top of the screen. Bentonite grout will the be added to the annulus between the casing and the inside auger wall to insure proper sealing. Grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or vertical flow above the screened interval. During placement of sand and bentonite frequent measurements will be made to check the height of the sand pack and thickness of bentonite-layers using a weighted drop tape measure.

APPENDIX C

ANALYTICAL DATA

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 1
VOLATILE FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-5S

DATE SAMPLED: 06/07/85 TIME: 8:30 AM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 06/29/85

SAMPLE NO. 52221

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
CHLOROMETHANE	*	0.010	1,2-DICHLOROPROPANE	*	0.001
BROMOMETHANE	*	0.010	1,1,2-TRICHLOROETHANE	*	0.001
VINYL CHLORIDE	0.070	0.010	BENZENE	*	0.001
CHLOROETHANE	*	0.010	BROMOFORM	*	0.001
METHYLENE CHLORIDE	*	0.001	1,1,2,2-TETRACHLOROETHANE	*	0.001
TRICHLOROFLUOROMETHANE	*	0.001	TETRACHLOROETHYLENE	*	0.001
1,1-DICHLOROETHYLENE	*	0.001	TOLUENE	*	0.001
1,1-DICHLOROETHANE	*	0.001	CHLOROBENZENE	*	0.001
TRANS-1,2-DICHLOROETHYLENE	0.023	0.001	ETHYL BENZENE	*	0.001
CHLOROFORM	*	0.001	ACROLEIN	*	0.010
1,2-DICHLOROETHANE	*	0.001	ACRYLONITRILE	*	0.010
1,1,1-TRICHLOROETHANE	*	0.001	DICHLORODIFLUOROMETHANE	*	0.010
CARBON TETRACHLORIDE	*	0.001	CHLORODIBROMOMETHANE	*	0.001
BROMODICHLOROMETHANE	*	0.001	CIS-1,3-DICHLOROPROPYLENE	*	0.001
TRICHLOROETHYLENE	*	0.001	TRANS-1,3-DICHLOROPROPYLENE	*	0.001
2-CHLOROETHYLVINYL ETHER	*	0.010	BIS-(CHLOROMETHYL) ETHER	*	0.010

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 1
VOLATILE FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W7S

DATE SAMPLED: 06/07/85 TIME: 2:15 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 06/30/85

SAMPLE NO. 52224

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
CHLOROMETHANE	*	0.010	1,2-DICHLOROPROPANE	*	0.001
BROMOMETHANE	*	0.010	1,1,2-TRICHLOROETHANE	*	0.001
VINYL CHLORIDE	*	0.010	BENZENE	*	0.001
CHLOROETHANE	*	0.010	BROMOFORM	*	0.001
METHYLENE CHLORIDE	*	0.001	1,1,2,2-TETRACHLOROETHANE	*	0.001
TRICHLOROFLUOROMETHANE	*	0.001	TETRACHLOROETHYLENE	*	0.001
1,1-DICHLOROETHYLENE	*	0.001	TOLUENE	*	0.001
1,1-DICHLOROETHANE	*	0.001	CHLOROBENZENE	*	0.001
TRANS-1,2-DICHLOROETHYLENE	*	0.001	ETHYL BENZENE	*	0.001
CHLOROFORM	*	0.001	ACROLEIN	*	0.010
1,2-DICHLOROETHANE	*	0.001	ACRYLONITRILE	*	0.010
1,1,1-TRICHLOROETHANE	*	0.001	DICHLORODIFLUOROMETHANE	*	0.010
CARBON TETRACHLORIDE	*	0.001	CHLORODIBROMOMETHANE	*	0.001
BROMODICHLOROMETHANE	*	0.001	CIS-1,3-DICHLOROPROPYLENE	*	0.001
TRICHLOROETHYLENE	*	0.001	TRANS-1,3-DICHLOROPROPYLENE	*	0.001
2-CHLOROETHYLVINYL ETHER	*	0.010	BIS-(CHLOROMETHYL) ETHER	*	0.010

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 1
VOLATILE FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-5D

DATE SAMPLED: 06/07/85 TIME: 1:30 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 06/19/85

SAMPLE NO. 52232

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
CHLOROMETHANE	*	0.25	1,2-DICHLOROPROPANE	*	0.025
BROMOMETHANE	*	0.25	1,1,2-TRICHLOROETHANE	*	0.025
VINYL CHLORIDE	*	0.25	BENZENE	*	0.025
CHLOROETHANE	*	0.25	BROMOFORM	*	0.025
METHYLENE CHLORIDE	0.047	0.025	1,1,2,2-TETRACHLOROETHANE	*	0.025
TRICHLOROFLUOROMETHANE	*	0.025	TETRACHLOROETHYLENE	*	0.025
1,1-DICHLOROETHYLENE	*	0.025	TOLUENE	*	0.025
1,1-DICHLOROETHANE	*	0.025	CHLOROBENZENE	*	0.025
TRANS-1,2-DICHLOROETHYLENE	*	0.025	ETHYL BENZENE	*	0.025
CHLOROFORM	*	0.025	ACROLEIN	*	0.25
1,2-DICHLOROETHANE	*	0.025	ACRYLONITRILE	*	0.25
1,1,1-TRICHLOROETHANE	*	0.025	DICHLORODIFLUOROMETHANE	*	0.25
CARBON TETRACHLORIDE	*	0.025	CHLORODIBROMOMETHANE	*	0.025
BROMODICHLOROMETHANE	*	0.025	CIS-1,3-DICHLOROPROPYLENE	*	0.025
TRICHLOROETHYLENE	*	0.025	TRANS-1,3-DICHLOROPROPYLENE	*	0.025
2-CHLOROETHYLVINYL ETHER	*	0.25	BIS-(CHLOROMETHYL) ETHER	*	0.25

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 1
VOLATILE FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-7D

DATE SAMPLED: 06/07/85 TIME: 2:00 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 06/24/85

SAMPLE NO. 52234

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
CHLOROMETHANE	*	0.010	1,2-DICHLOROPROPANE	*	0.001
BROMOMETHANE	*	0.010	1,1,2-TRICHLOROETHANE	*	0.001
VINYL CHLORIDE	*	0.010	BENZENE	*	0.001
CHLOROETHANE	*	0.010	BROMOFORM	*	0.001
METHYLENE CHLORIDE	*	0.001	1,1,2,2-TETRACHLOROETHANE	*	0.001
TRICHLOROFLUOROMETHANE	*	0.001	TETRACHLOROETHYLENE	*	0.001
1,1-DICHLOROETHYLENE	*	0.001	TOLUENE	0.005	0.001
1,1-DICHLOROETHANE	*	0.001	CHLOROBENZENE	*	0.001
TRANS-1,2-DICHLOROETHYLENE	*	0.001	ETHYL BENZENE	*	0.001
CHLOROFORM	0.006	0.001	ACROLEIN	*	0.010
1,2-DICHLOROETHANE	*	0.001	ACRYLONITRILE	*	0.010
1,1,1-TRICHLOROETHANE	*	0.001	DICHLORODIFLUOROMETHANE	*	0.010
CARBON TETRACHLORIDE	*	0.001	CHLORODIBROMOMETHANE	*	0.001
BROMODICHLOROMETHANE	*	0.001	CIS-1,3-DICHLOROPROPYLENE	*	0.001
TRICHLOROETHYLENE	*	0.001	TRANS-1,3-DICHLOROPROPYLENE	*	0.001
2-CHLOROETHYLVINYL ETHER	*	0.010	BIS-(CHLOROMETHYL) ETHER	*	0.010

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 1
VOLATILE FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: P-10

DATE SAMPLED: 06/06/85 TIME: 4:30 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 06/25/85

SAMPLE NO. 52255

COMPOUND	RESULT (mg/1)	D.L.	COMPOUND	RESULT (mg/1)	D.L.
CHLOROMETHANE	*	0.010	1,2-DICHLOROPROPANE	*	0.001
BROMOMETHANE	*	0.010	1,1,2-TRICHLOROETHANE	*	0.001
VINYL CHLORIDE	0.015	0.010	BENZENE	*	0.001
CHLOROETHANE	*	0.010	BROMOFORM	*	0.001
METHYLENE CHLORIDE	*	0.001	1,1,2,2-TETRACHLOROETHANE	*	0.001
TRICHLOROFLUOROMETHANE	*	0.001	TETRACHLOROETHYLENE	*	0.001
1,1-DICHLOROETHYLENE	*	0.001	TOLUENE	0.006	0.001
1,1-DICHLOROETHANE	*	0.001	CHLOROBENZENE	*	0.001
TRANS-1,2-DICHLOROETHYLENE	0.008	0.001	ETHYL BENZENE	*	0.001
CHLOROFORM	*	0.001	ACROLEIN	*	0.010
1,2-DICHLOROETHANE	*	0.001	ACRYLONITRILE	*	0.010
1,1,1-TRICHLOROETHANE	*	0.001	DICHLORODIFLUOROMETHANE	*	0.010
CARBON TETRACHLORIDE	*	0.001	CHLORODIBROMOMETHANE	*	0.001
BROMODICHLOROMETHANE	*	0.001	CIS-1,3-DICHLOROPROPYLENE	*	0.001
TRICHLOROETHYLENE	*	0.001	TRANS-1,3-DICHLOROPROPYLENE	*	0.001
2-CHLOROETHYLVINYL ETHER	*	0.010	BIS-(CHLOROMETHYL) ETHER	*	0.010

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 2
BASE-NEUTRAL FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-5D

DATE SAMPLED: 06/07/85 TIME: 1:30 PM
DATE RECEIVED: 061185 TIME: 7:00 AM
DATE COMPLETED: 07/02/85

SAMPLE NO. 52232

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
HEXACHLOROETHANE	*	0.001	BENZIDINE	*	0.010
HEXACHLOROBUTADIENE	*	0.001	PYRENE	*	0.001
1,2,4-TRICHLOROBENZENE	*	0.001	FLUORANTHENE	*	0.001
NAPHTHALENE	*	0.001	CHRYSENE	*	0.010
HEXACHLOROCYCLOPENTADIENE	*	0.001	BIS-(2-ETHYL HEXYL)-PHTHALATE	*	0.001
NITROBENZENE	*	0.001	BENZO (A) ANTHRACENE	*	0.010
2-CHLORONAPHTHALENE	*	0.001	BENZO (K) FLUORANTHENE	*	0.010
ACENAPHTHENE	*	0.001	BENZO (A) PYRENE	*	0.010
ISOPHORONE	*	0.001	INDENO (1,2,3-CD) PYRENE	*	0.010
FLUORENE	*	0.001	DIBENZO (A,H) ANTHRACENE	*	0.010
2,4-DINITROTOLUENE	*	0.001	BENZO (G,H,I) PERYLENE	*	0.010
1,2-DIPHENYLHYDRAZINE	*	0.001	3,3'-DICHLOROBENZIDINE	*	0.010
2,6-DINITROTOLUENE	*	0.001	TETRACHLORODIBENZO-P-DIOXIN	*	0.010
N-NITROSODIPHENYLAMINE	*	0.001	N-NITROSO-DI-N-PROPYLAMINE	*	0.001
HEXACHLOROBENZENE	*	0.001	ACENAPHTHYLENE	*	0.001
4-BROMOPHENYL PHENYL ETHER	*	0.001	BIS(2-CHLOROISOPROPYL)-ETHER	*	0.001
4-CHLOROPHENYL PHENYL ETHER	*	0.001	BIS(2-CHLOROEXTHOXY)-METHANE	*	0.001
ANTHRACENE	*	0.001	1,2-DICHLOROBENZENE	*	0.001
PHENANTHRENE	*	0.001	1,3-DICHLOROBENZENE	*	0.001
DIMETHYL PHTHALATE	*	0.001	1,4-DICHLOROBENZENE	*	0.001
BIS-(2-CHLOROETHYL) ETHER	*	0.001	N-NITROSODIMETHYLAMINE	*	0.010
DI-N-BUTYL PHTHALATE	*	0.001	BENZO (B) FLUORANTHENE	*	0.010
DIETHYL PHTHALATE	*	0.001	DI-N-OCTYLPHTHALATE	*	0.001
BUTYL BENZYL PHTHALATE	*	0.001			

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 2
BASE-NEUTRAL FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-7D

DATE SAMPLED: 06/07/85 TIME: 2:00 PM
DATE RECEIVED: 061185 TIME: 7:00 AM
DATE COMPLETED: 07/02/85

SAMPLE NO. 52234

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
HEXACHLOROETHANE	*	0.001	BENZIDINE	*	0.010
HEXACHLOROBUTADIENE	*	0.001	PYRENE	*	0.001
1,2,4-TRICHLOROBENZENE	*	0.001	FLUORANTHENE	*	0.001
NAPHTHALENE	*	0.001	CHRYSENE	*	0.010
HEXACHLOROCYCLOPENTADIENE	*	0.001	BIS-(2-ETHYL HEXYL)-PHTHALATE	*	0.001
NITROBENZENE	*	0.001	BENZO (A) ANTHRACENE	*	0.010
2-CHLORONAPHTHALENE	*	0.001	BENZO (K) FLUORANTHENE	*	0.010
ACENAPHTHENE	*	0.001	BENZO (A) PYRENE	*	0.010
ISOPHORONE	*	0.001	INDENO (1,2,3-CD) PYRENE	*	0.010
FLUORENE	*	0.001	DIBENZO (A,H) ANTHRACENE	*	0.010
2,4-DINITROTOLUENE	*	0.001	BENZO (G,H,I) PERYLENE	*	0.010
1,2-DIPHENYLHYDRAZINE	*	0.001	3,3'-DICHLOROBENZIDINE	*	0.010
2,6-DINITROTOLUENE	*	0.001	TETRACHLORODIBENZO-P-DIOXIN	*	0.010
N-NITROSODIPHENYLAMINE	*	0.001	N-NITROSO-DI-N-PROPYLAMINE	*	0.010
HEXACHLOROBENZENE	*	0.001	ACENAPHTHYLENE	*	0.001
4-BROMOPHENYL PHENYL ETHER	*	0.001	BIS(2-CHLOROISOPROPYL)-ETHER	*	0.001
4-CHLOROPHENYL PHENYL ETHER	*	0.001	BIS(2-CHLOROEXTHOXY)-METHANE	*	0.001
ANTHRACENE	*	0.001	1,2-DICHLOROBENZENE	*	0.001
PHENANTHRENE	*	0.001	1,3-DICHLOROBENZENE	*	0.001
DIMETHYL PHTHALATE	*	0.001	1,4-DICHLOROBENZENE	*	0.001
BIS-(2-CHLOROETHYL) ETHER	*	0.001	N-NITROSODIMETHYLAMINE	*	0.001
DI-N-BUTYL PHTHALATE	*	0.001	BENZO (B) FLUORANTHENE	*	0.010
DIETHYL PHTHALATE	*	0.001	DI-N-OCTYLPHTHALATE	*	0.010
BUTYL BENZYL PHTHALATE	*	0.001		*	0.001

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
EDI LABORATORY REPORT

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
LOCATION: SYRACUSE, NY
SAMPLED BY: MRL, FCE
DESCRIPTION: HYDROGEO. INVESTIGATION

DATE SAMPLED: 00/00/00 TIME:
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 07/12/85
SCHEDULED COMPLETION: 7/12/85
ANALYST: MK,EH,BH
QUALITY CONTROL REVIEW BY: DMF
WORKSHEET NO: 3

	W-5D 6/7/85	W-6D 6/7/85	W-7D 6/7/85	W-8D 6/7/85	DETECTION LIMIT	UNITS
EDI SAMPLE NO:	52232	52233	52234	52235		
SILVER,TOTAL	<0.02	<0.02	<0.02	<0.02	0.02	mg/l
ARSENIC,TOTAL	<2.0	<2.0	<2.0	<2.0	2.0	ug/l
BERYLLIUM,TOTAL	<0.01	<0.01	<0.01	<0.01	0.01	mg/l
CADMIUM,TOTAL	<0.01	<0.01	<0.01	<0.01	0.01	mg/l
CHROMIUM,TOTAL	<0.02	<0.02	<0.02	<0.02	0.02	mg/l
COPPER,TOTAL	<0.01	<0.01	0.05	<0.01	0.01	mg/l
MERCURY,TOTAL	<0.2	<0.2	<0.2	<0.2	0.2	ug/l
NICKEL,TOTAL	0.05	0.08	0.07	0.09	0.02	mg/l
LEAD,TOTAL	<0.02	<0.02	0.06	<0.02	0.02	mg/l
ANTIMONY,TOTAL	<0.10	<0.10	<0.10	0.10	0.10	mg/l
SELENIUM,TOTAL	<2.0	<2.0	<2.0	<2.0	2.0	ug/l
THALLIUM,TOTAL	<0.05	<0.05	<0.05	<0.05	0.05	mg/l
ZINC,TOTAL	0.06	0.02	0.05	<0.02	0.02	mg/l
TIME SAMPLED:	1:30 PM	2:40 PM	2:00 PM	3:00 PM		

ANALYSIS BY STANDARD METHODS, 15TH EDITION, AND/OR METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES, EPA, 1983.

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 3
ACID FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-5D

DATE SAMPLED: 06/07/85 TIME: 1:30 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 07/02/85

SAMPLE NO. 52232

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
2-CHLOROPHENOL	*	0.001	PHENOL	*	0.001
2,4-DICHLOROPHENOL	*	0.001	2-NITROPHENOL	*	0.001
4-CHLORO-3-METHYLPHENOL	*	0.001	2,4,6-TRICHLOROPHENOL	*	0.001
2,4-DIMETHYLPHENOL	*	0.001	2-METHYL-4,6-DINITROPHENOL	*	0.10
4-NITROPHENOL	*	0.050	PENTACHLOROPHENOL	*	0.050
2,4-DINITROPHENOL	*	0.10			

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 3
ACID FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-7D

DATE SAMPLED: 06/07/85 TIME: 2:00 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 07/02/85

SAMPLE NO. 52234

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
2-CHLOROPHENOL	*	0.001	PHENOL	*	0.001
2,4-DICHLOROPHENOL	*	0.001	2-NITROPHENOL	*	0.001
4-CHLORO-3-METHYLPHENOL	*	0.001	2,4,6-TRICHLOROPHENOL	*	0.001
2,4-DIMETHYLPHENOL	*	0.001	2-METHYL-4,6-DINITROPHENOL	*	0.10
4-NITROPHENOL	*	0.050	PENTACHLOROPHENOL	*	0.050
2,4-DINITROPHENOL	*	0.10			

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 4
PESTICIDES FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-5D

DATE SAMPLED: 06/07/85 TIME: 1:30 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 07/11/85

SAMPLE NO. 52232

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
ALDRIN	*	0.001	ENDRIN ALDEHYDE	*	0.001
A-BHC	*	0.001	HEPTACHLOR	*	0.001
B-BHC	*	0.001	HEPTACHLOR EPOXIDE	*	0.001
D-BHC	*	0.001	TOXAPHENE	*	0.002
G-BHC	*	0.001	CHLORDANE	*	0.001
4-4'DDD	*	0.001	PCB-1016	_____	_____
4-4'DDE	*	0.001	PCB-1221	_____	_____
4-4'DDT	*	0.001	PCB-1232	_____	_____
DIELDRIN	*	0.001	PCB-1242	_____	_____
A-ENDOSULFAN	*	0.001	PCB-1248	_____	_____
B-ENDOSULFAN	*	0.001	PCB-1254	_____	_____
ENDOSULFAN SULFATE	*	0.001	PCB-1260	_____	_____
ENDRIN	*	0.001			

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL SERVICES
PRIORITY POLLUTANT ANALYSIS

TABLE 4
PESTICIDES FRACTION

CLIENT: G.M. FISHER GUIDE DIVISION
PROJECT NO.: 25475
SAMPLE: W-7D

DATE SAMPLED: 06/07/85 TIME: 2:00 PM
DATE RECEIVED: 06/11/85 TIME: 7:00 AM
DATE COMPLETED: 07/11/85

SAMPLE NO. 52234

COMPOUND	RESULT (mg/l)	D.L.	COMPOUND	RESULT (mg/l)	D.L.
ALDRIN	*	0.001	ENDRIN ALDEHYDE	*	0.001
A-BHC	*	0.001	HEPTACHLOR	*	0.001
B-BHC	*	0.001	HEPTACHLOR EPOXIDE	*	0.001
D-BHC	*	0.001	TOXAPHENE	*	0.002
G-BHC	*	0.001	CHLORDANE	*	0.001
4-4'DDD	*	0.001	PCB-1016	______	______
4-4'DDE	*	0.001	PCB-1221	______	______
4-4'DDT	*	0.001	PCB-1232	______	______
DIELDRIN	*	0.001	PCB-1242	______	______
A-ENDOSULFAN	*	0.001	PCB-1248	______	______
B-ENDOSULFAN	*	0.001	PCB-1254	______	______
ENDOSULFAN SULFATE	*	0.001	PCB-1260	______	______
ENDRIN	*	0.001			

*COMPOUND NOT PRESENT AT DETECTION LIMIT

ANALYTICAL RESULTS

EMPIRE THOMSEN
GAS CHROMATOGRAPHY

Report Date: 7/17/85
Date Received: 6/11/85

SAMPLE IDENTIFICATION	SAMPLE DATE	EXTRACTION DATE	ANALYSIS DATE	PARAMETER (UNITS OF MEASURE) TOTAL POLYCHLORINATED BIPHENYLS (ug/l AS AROCLOR 1248)
V-2	6/6/85	6/13/85	7/12/85	<0.2
W-4D	6/6/85	6/13/85	7/12/85	<0.2
V-1D	6/7/85	6/15/85	6/24/85	<3
S-2	6/7/85	6/15/85	6/22/85	<0.1
S-4	6/7/85	6/15/85	6/22/85	<0.1
W-3D	6/7/85	6/15/85	6/22/85	3.7
W-2D	6/7/85	6/15/85	6/22/85	<0.1
W-9D	6/7/85	6/15/85	6/22/85	<0.1
W-9DA	6/7/85	6/15/85	6/22/85	<0.1
W-5D	6/7/85	6/15/85	6/22/85	<0.1
W-7D	6/7/85	6/15/85	6/22/85	<2
W-1D	6/7/85	6/15/85	6/22/85	≤0.7
W-6D	6/7/85	6/15/85	6/22/85	2.0
S-3	6/7/85	6/15/85	6/22/85	≤0.8
Field Blank	-	6/15/85	7/12/85	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES [illegible signature]

DATE 7/17/85

RECRA ENVIRONMENTAL LABORATORIES

APPENDIX D

GROUND WATER SAMPLING PROCEDURES

GROUND WATER SAMPLING PROCEDURES

Materials

1. Disposable Latex Gloves
2. Plastic Sheeting (10 ft. by 10 ft. minimum)
3. Bailers (top filling) - 1 1/2 inch stainless steel.
4. Polypropylene Rope
5. Distilled Water
6. Acetone or Hexane Solvent
7. Clean Disposal be Towels
8. "Soiltest" Water Level Indicator of 100 ft. Steel Tape
9. Tygon Tubing (3/8-inch)
10. Insulated Transport Containers
11. Graduated Pail
12. Conductivity Meter
13. pH Meter
14. Safety Glasses or Goggles
15. Appropriate Sampling Containers
16. Vacuum Flasks (1,000 ml and 250 ml) and Associated Fittings

General

The following procedures must be adhered to during all well developing and sampling operations. Hard hats and safety glasses or goggles must be work at all times during well development or sampling to prevent splashing or potentially contaminated water into the eyes. Sampling of wells must be discontinued during precipitation periods.

Sampling Procedures Using a Bailer

The following procedure is suitable for sampling wells where water levels are at a depth less than 30 feet.

1. Identify the well and record the location on the Ground Water Sampling Field Log. (Attached)
2. Cut a slit in one side of the plastic sheet and slip it over and around the well, creating a clean surface onto which the sampling equipment can be positioned. This clean working area should be a minimum of 10 feet of 10 feet. Do not kick, transfer, drop, or in any way let soils or other materials fall onto this sheet unless it comes from inside the well. Do not place meters, tools, equipment, etc. on the unless they have been cleaned first with a clean rag.
3. Put on a new pair of disposable gloves.
4. Clean the well cap with a clean towel and remove the well cap and plug, placing both on the plastic sheet.
5. Clean the first ten feet of the steel 100 foot tape or electric water level indicator with an acetone soaked towel, rinse with distilled water and measure the depth to the water table. Record this information on the Ground Water Sampling Field Log.
6. Compute the volume of water in the well using the formulae and information provided on the Ground Water Sampling Field Log. Record this volume on the Ground Water Field Log.
7. Attach enough clean polypropylene rope to a bailer to reach the bottom of the well and lower the bailer slowly into the

well, making certain to submerge it only far enough to fill it completely

8. Pull the bailer out of the well, keeping the polypropylene rope on the plastic sheet. Empty the ground water from the bailer into the new glass quart container and observe its appearance. Return the glass quart to its proper transport container. Note: This sample will not undergo laboratory analysis, and is collected to observe the physical appearance of the ground water only.

9. Record the physical appearance of the ground water on the Ground Water Sampling Field Log.

10. Lower the bailer to the bottom of the well and agitate the bailer up and down to resuspend any material settled in the well.

11. Initiate bailing the well from the well bottom making certain to keep the polypropylene rope on the plastic sheet. All ground water should be dumped from the bailer into a graduated pail to measure the quantity of water removed from the well.

12. Continue bailing the well from the bottom until three times the volume of ground water in the well has been removed, or until the well is bailed dry. If the well is bailed dry, allow sufficient time (several hours to overnight) for the well to recover before proceeding with Step 13. Record this information on the Ground Water Sampling Field Log.

13. Remove the sampling bottles from their transport containers and prepare the bottles for receiving samples. Inspect all labels to insure proper sample identification. Sample bottles

should be kept cool with their caps on until they are ready to receive samples. Arrange the sampling containers to allow for convenient filling. Always fill the containers for Total Organic Halogens (TOH) and Volatile Halogenated Organics (VHO) first.

14. Initiate sampling by lowering the bailer slowly into the well, making certain to submerge it only far enough to fill it completely. Minimize agitation of the water in the well. Fill each sample container following the instructions in the Sample Preservation Procedures. Return each sample bottle to its proper transport containers.
15. Record the physical appearance of the ground water observed during sampling on the Ground Water Sampling Field Log.
16. After the last sample has been collected, record the date and time, empty one bailer of water from the surface of the water in the well into the 250 ml flask, measure and record the pH, specific conductivity and temperature of the ground water following the procedures outlined in the equipment operation manuals. Record this information on the Ground Water Sampling Field Log. The 250 ml flask must then be rinsed with acetone and distilled water prior to reuse.
17. Replace the well plug and lock the well protection assembly before leaving the well location.
18. Place the polypropylene rope, gloves, towels, and plastic sheeting into a plastic bag for disposal.
19. Begin Chain of Custody procedures.

Attachment

GROUND WATER SAMPLING FIELD LOG

Sample Location ______________________________ Well No. __________

Sampled By ______________________ Date __________ Time __________

Weather ______________________ Sampled with Bailer _____ Pump _____

A. WATER TABLE:

Well depth:
(below top of casing) _______ ft.

Well elevation:
(top of casing) _______ ft.

Depth to water table:
(below top of casing) _______ ft.

Water table elevation: _______ ft.

Length of water column (LWC) __________ ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = __________ gallons
4" diameter wells = 0.653 X (LWC) = __________ gallons
6" diameter wells = 1.469 X (LWC) = __________ gallons

B. PHYSICAL APPEARANCE AT START:

Color ______________ Odor ______________ Turbidity __________

Was an oil film or layer apparent? ______________________________

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling ________________ gallons.

Did well go dry? ______________

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color ______________ Odor ______________ Turbidity __________

Was an oil film or layer apparent? ______________________________

E. CONDUCTIVITY ________________

F. pH ________________

G. TEMPERATURE ________________

H. WELL SAMPLING NOTES:

____

____

____

____

____

____

____

____

Attachment

O'BRIEN & GERE

CHAIN OF CUSTODY RECORD

SURVEY

SAMPLERS: (Signature)

STATION NUMBER	STATION LOCATION	DATE	TIME	SAMPLE TYPE			SEQ. NO.	NO. OF CONTAINERS	ANALYSIS REQUIRED
				Water		Air			
				Comp.	Grab.				

Relinquished by: (Signature) | Received by: (Signature) | Date/Time

Relinquished by: (Signature) | Received by: (Signature) | Date/Time

Relinquished by: (Signature) | Received by: (Signature) | Date/Time

Relinquished by: (Signature) | Received by Mobile Laboratory for field analysis: (Signature) | Date/Time

Dispatched by: (Signature) | Date/Time | Received for Laboratory by: | Date/Time

Method of Shipment:

GO 3420-2FN 100M 7/85

BILL OF LADING / SHIPPING NOTICE / INVOICE

CHARGE TO	CAR INITIALS & NO.	SEAL NOS	DATE SHIPPED	PAGE	BILL OF LADING NO
FISHER GUIDE DIB GMC 1000 TOWNLINE RD. SYRACUSE, NY 13221	FED EXP 1		5/13/88	1 OF 1	216631

ROUTING	FREIGHT TERMS	LENGTH
FEDERAL EXPRESS	*PREPAID	

SHIP TO:
BUR OF HAZ WSTE TECH
DIV HAZ SUBS. REGS.
NEW YORK STATE DEPT OF ENV CONS
[illegible] RD.

PICK-UP CARRIER:

EXEMPT CERT. NO.: FED EXP 1

SHIPPER
FISHER GUIDE DIVISION
SYRACUSE PLANT
PO BOX 4869
SYRACUSE, NY 132

SPECIAL INSTRUCTIONS:
ALBANY, NY 12233
*FED EX 7885775741
ATTN: MR. PAUL COUNTERMAN

DATE ISSUED	DEST. CODE	SUPPLIER CODE	T/M	PREPARED BY
5/13/88		[illegible]		MARY K. FOX TM

HM	PALLETS	RACKS	CARTONS	OTHER	DESCRIPTION OF ARTICLES, SPECIAL MARKS & EXCEPTIONS	NET WEIGHT	TARE WEIGHT
	*	*	*	*	*	*	*

RECEIVED
MAY 16 1988
Bureau of Hazardous Waste Facility Permitting
Division of Hazardous Substances Regulation

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Fisher Guide Division
General Motors Corporation

Per ______________________
(Signature of Consignor)

NET WEIGHT

TARE WEIGHT

The description and weight indicated on this bill of lading are correct. Subject to verification by the Weighing and Inspection Bureau having jurisdiction according to Agreement.

TOTAL CONTAINERS (FORWARDING)

PALLETS	**RACKS	CARTONS	OTHER	TOTAL CONTAINERS	GROSS WEIGHT

**RETURNABLE RACKS MUST BE RETURNED TO FISHER GUIDE DIVISION IN THE MOST ECONOMICAL MANNER

RECEIVED PURSUANT TO THE TERMS OF THE SHORT FORM BILL OF LADING IN EFFECT ON THE DATE OF THIS SHIPPING ORDER

AGENT

PER DATE

SHIPPER NOS: * *1 * *1 * 10

BILL OF LADING NO: FEDERAL EXPRESS

INVOICE TERMS: 216631

DATE INVOICED:

INVOICE NO:

PART NO.	REFERENCE NO.	M/Y	PACK UNITS	PACK TYPE	DESCRIPTION OF MATERIAL	QUANTITY SHIPPED	UNIT	UNIT PRICE	AMOUNT
RFC 697535 (W. KOCHEM)									
					ENVELOPE CONTAINING IMPOUNDMNET CLOSURE PLAN GOING TO DEX FOR REVIEW	2 PCS			

LICENSE NUMBER	DATE	TIME	SECURITY OFFICER'S SIGNATURE

PACKING SLIP

FISHER GUIDE

Fisher Guide Division
General Motors Corporation

1000 Town Line Road
Syracuse, New York 13221-4869

Syracuse Plant

PEL WK88-010
May 10, 1988

Paul R. Counterman, P.E.
Director
Bureau of Hazardous Waste
Facility Permitting
Division of Hazardous Substances
Regulation
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233

RECEIVED
MAY 1 [illegible] 1988

Re: Surface Impoundment Closure Plan
EPA ID NYD002239440

Dear Mr. Counterman:

Enclosed are two (2) copies of the revised Surface Impoundment Closure Plan for the GM-Fisher Guide facility. The revision tracks the changes discussed in our letter to you of March 30, 1988 and we have the following additional comments:

1. Commencement of Work. In the revised closure plan, we propose to re-characterize the waste materials in the surface impoundments and install a series of groundwater wells. It is our understanding that these activities can proceed prior to regulatory approval of the closure plan and we ask your permission to proceed with this work as soon as possible.

2. Meadowbrook Soils. It remains our intention to use the Meadowbrook soils in the surface impoundment closure. However, our use is contingent on achieving a satisfactory arrangement with Onondaga County on the excavation and transportation of these materials and obtaining any required local permits. Also, please advise whether the EPA has raised any objections to the use of the Meadowbrook soils in the course of your office's conversations on the subject of the closure plan.

3. Post-closure period. For purposes of the closure plan, we have addressed only the five-year period following closure of the surface impoundments. We assume that the particulars of post-closure care and the extent of further post-closure groundwater monitoring will be addressed in a post-closure permit and will reflect the analytical data generated from the initial five-year period.

4. SEQR Process. We understand that the only approval required from the Department for this Project is approval of the closure plan. However, to perform the closure, we will need to obtain the following local agency approvals:

   a. Modification of our existing sewer use permit with the Onondaga County POTW. An application will be made to add to our list of wastewater sources the wastewater stream from the closure activities; however, the discharge to the POTW will meet all existing parameter limits;

   b. Excavation license from the Town of Salina. This license is required for any excavation or filling of more than ten (10) cubic yards of material.

A short Environment Assessment Form for this "unlisted" action will be prepared and filed with the applications for each of the foregoing approvals. Please confirm that the Department will be conducting the environmental review as lead agency.

If you or members of your staff have any questions with respect to the enclosure, contact may be made directly with either Tom Carlisle of Weston Services (Closure Plan) or Edwin Tifft of O'Brien & Gere Engineers (Groundwater Monitoring). Your patience and courtesies in this matter are appreciated.

Very truly yours,

FISHER GUIDE DIVISION
General Motors Corporation

Richard J. Larkin

Richard J. Larkin
Manager - Manufacturing Engineering

RJL/jhs

CC: Steve Kaminski,k P.E. (w/enclosure)
G. Michael McPeck, P.E. (w/enclosure)
Frank V. Bifera, Esq. (w/o enclosure)
Mr. Joseph Barry (w/o enclosure)

NUMBER OF PAGES INCLUDING COVER 9

DATE: 9/12/88

FISHER GUIDE-SYRACUSE PLANT

- D E X -

TO: Mr. Steven Kaminski DEX: (518) 457-1088

New York State Dept. of Environmental Conservation

50 Wolf Road

Albany, New York 12233

FROM: William E. Kochem - Fisher Guide - GMC - Syracuse

SUBJECT: Addendum - Impoundment Closure Plan.

NOTE: Steve, per our conversation today (9/12/88), attached is the Addendum as discussed.

* Please note that we will submit financial information and time schedules as soon as they are completed.

PLEASE TELEPHONE THE WRITER AT: (315) 432-5314

TO CONFIRM RECEIPT OF DOCUMENT.

THANK-YOU.

WILLIAM E. KOCHEM
FISHER GUIDE-SYRACUSE PLANT
PLANT ENGINEERING DEPARTMENT

ADDENDUM

Dated: September, 1988

This sets forth the modifications to the "Surface Impoundment Closure and Post-Closure Plan-General Motors Corporation, Fisher Guide Division, Syracuse, New York (the "Plan") prepared by Weston Services, Inc. and dated April 26, 1988. The headings set forth herein correspond to the headings in the Plan.

1.2 PROJECT OBJECTIVES

Insert at the end of the third paragraph at page 3 of the Plan the following:

"Attached as Exhibit A to the Addendum are two sketches of the Meadowbrook area which were a part of the O'Brien & Gere Report. They show all the sample locations and the reported PCB concentrations."

2.1 WASTE INVENTORY

Insert at the end of the paragraph on p. 7 of the Plan, the following:

"Following the submittal of the Plan, the sediments from the impoundments were re-characterized in July of 1988. Attached as Exhibit B is a copy of the analytical report and a sketch of the impoundments, showing sampling locations. The testing results showed PCB contamination in excess of 500 ppm (wet weight) in Impoundment #1. On the basis of these results, sediments from Impoundment #1 will be incinerated and sediments from Impoundment #2 will be disposed at a secure landburial facility.

*Fisher Guide will perform any additional characterization of the sediments which is required by the hazardous waste management facilities involved. Attached as Exhibit C is a copy of a typical waste characterization form which will need to be completed by Fisher Guide for the disposal facilities being considered for handling the PCB wastes at this site."

2.2.1 RUN-ON AND RUN-OFF CONTROL

Delete the last sentence in paragraph 1 at page 12 of the Plan and insert the following:

"During impoundment closure operations, Fisher Guide will make every effort to schedule Meadowbrook soil deliveries so that the soils can be immediately placed into the excavated impoundments upon arrival at the site.

Should stockpiling nevertheless occur, it will be for only a few days at most and a plastic cover with tie-downs will be placed on the pile. Furthermore, the stockpile will be situated directly adjacent to Impoundment #1 and any runoff will be directed into the impoundment by a shallow swale around the pile. Any runoff produced would not be any more hazardous than the Meadowbrook soils to be placed into the impoundment. In this case, the impoundment will serve as an effective catch basin."

2.2.2 DUST AND PARTICULATE CONTROL

Insert the following after the first paragraph at page 12 of the Plan:

"A water supply source will be maintained on site to control nuisance dust. A water hose with a pressure nozzle will be used to sprinkle temporary work areas, Meadowbrook soils during placement and the fill soils.

The impoundment sediments should not be overly dry during closure, but a hose will be used to control particulates, if necessary. Since placement of the Meadowbrook soils will only take a few days, fugitive dust from this phase of the work should be a minor concern. Fill soils will also be moisture-controlled during placement, not only to minimize dust, but also to meet compaction specifications."

2.3.1 OVERVIEW

Insert the following at the end of the fifth sentence of the first paragraph at page 12 of the Plan: "or a TSCA-approved incinerator facility. (See ¶ 2.1 of this Addendum)"

2.3.2 REMOVAL/TREATMENT OF SUPERNATANT

Delete the existing paragraphs at page 13 of the Plan and insert the following:

"During the July, 1988 recharacterization program, three (3) samples were taken of impoundment supernatant and analyzed for PCBs at a NYDEC certified laboratory. Two samples were duplicates from Impoundment #1, and the third from the smaller Impoundment #2. An average of 7.05 ug/l of Aroclor 1242 was detected in these samples (4.2/16 ug/l - Impoundment #1 and .95 ug/l - Impoundment #2); Aroclor 1242 was the only PCB detected. The discharge limit for PCBs in Fisher Guide's POTW permit is 2.0 ug/l for total PCBs (Aroclors) as defined by U.S. EPA Method 608.

As part of the closure operations, all supernatant waters will be pretreated in a portable carbon filtration unit to be located next to the impoundments. Supernatant will first be pumped to a settling tank to remove coarse solids. From the tank, the water will go through portable activated carbon columns to remove PCBs. Supernatant will then be directed to portable batch tanks for sampling. These tanks may be one-piece molded units or formed units with a flexible membrane line. When each batch unit is filled, a sample will be taken and analyzed for PCBs at a local laboratory which has been certified by the NYDEC.

* Confirmed with Regional H_2O ?

Pending favorable results from the laboratory, each batch tank will be pumped to Fisher Guide's on-site wastewater treatment plant ("WWTP") for more treatment prior to discharge to the Onondaga County POTW. The Fisher Guide WWTP also includes a carbon filtration unit. However, the capacity of that system is limited, and the carbon unit may not be available for supernatant and decontamination water treatment at the on-site WWTP during closure operations.

To facilitate continuous treatment of supernatant, at least two batch tanks will be used to store treated water prior to discharge to the on-site WWTP. Samples will be analyzed with a 24-hour turn-around time at a locally NYDEC certified laboratory."

2.3.4 IMPOUNDMENT STRUCTURES DISMANTLING, DECONTAMINATION AND/OR DISPOSAL

Insert the following at the end of the first paragraph at page 14 of the Plan:

"Notwithstanding the foregoing, impacted concrete and wood will not be decontaminated but disposed as hazardous waste in a secure landburial facility. Washwater analysis will be performed to ensure that discharge standards are met."

2.3.5 BACKFILLING, GRADING, AND LANDSCAPING, IMPOUNDMENT NO. 2

Insert the following as a second paragraph at page 15 of the Plan:

"Fisher Guide will perform verification soil sampling and analysis for Impoundment #2. If the health-based standards for the contaminants of concern are not met before groundwater is encountered, an impermeable cap will be installed. The design and construction of the cap will be similar to that of Impoundment #1." ?

2.3.6 DESIGN AND CONSTRUCTION OF MEADOWBROOK PLACEMENT AREA

Modify as follows:

(a) Insert the following as a new sentence after the fifth sentence of the first paragraph at page 18 of the Plan: "All modeling data used in the Hydrologic Evaluation of Landfill Performance (HELP) model will be provided to NYDEC. This includes climatological data, soil and waste characteristics, and other input values."

(b) Delete the reference to "10^{-6} cm/sec" in the fourth full paragraph at page 18 of the Plan and insert: "10^{-7} cm/sec or less."

This statement can not be made.

*(c) Delete the final paragraph of the section at page 23 of the Plan and insert the following: "GMC Fisher Guide understands that the two closed impoundment areas can be used for other purposes provided that GMC Fisher Guide satisfies the concerns of NYDEC with respect to potential environmental impact of the proposed project, including impacts on post-closure care."

2.4 VERIFICATION SOIL SAMPLING AND ANALYSIS PLAN

Delete in the 23rd line of the first paragraph at page 23 of the Plan the reference to "six inches" and insert "twelve inches."

2.4.2 LABORATORY ANALYSIS

Delete in the first sentence of the first paragraph at page 24 of the Plan: "or USEPA."

2.7 HEALTH AND SAFETY

Modify as follows:

(a) Insert in the first sentence of the first paragraph at page 28 of the Plan the word "construction" between "impoundment" and "closure."

(b) Insert at the end of the first paragraph at page 28 of the Plan the following: "No construction activities will take place before NYDEC approval of the Site Safety Plan ("SSP")."

(c) Insert the following immediately before the final paragraph in the section at page 29 of the Plan:

"The three zones will be delineated in the SSP. Levels of protection required for each zone, and the criteria that will be used to upgrade the level of protection in the work zone will be fully described in the SSP.

Particulate sampling for PCBs will be conducted at the site to provide health and safety monitoring. The SSP will define safe levels and the steps to be taken if they are exceeded. Volatilization of the PCBs should not be a problem at this site. PCBs are virtually nonvolatile in the absorbed state. Considering the tendency for PCBs to preferentially partition into the organic phase of soils, little or no volatilization should occur during closure operations."

2.9 <u>SCHEDULE FOR CLOSURE</u>

Delete the existing paragraph at page 30 of the Plan and insert the following:

"Attached as Exhibit D to the Addendum is a revised Figure 3 which presents the anticipated schedule for the phased closure of the two impoundments at the GMC-Fisher Guide facility. Provided all the necessary approvals are obtained by October 31, 1988, the closure of Impoundment #2 will take place in 1988. Due to the difficulties encountered in scheduling deliveries to the incinerator facilities, closure of Impoundment #1 will take place in the spring of 1989."

2.10 <u>POST-CLOSURE PLAN</u>

Insert the following as the new first sentence in the second paragraph at page 30 of the Plan: "Post-closure care described in the plan will continue in accordance with the post-closure permit to be issued following the completion of the construction closure activities." Delete the word "the" in the last line of the second paragraph and insert "a".

3.0 <u>CLOSURE/POST CLOSURE COST ESTIMATE/ FINANCIAL REQUIREMENTS</u>

Delete the first sentence of the second paragraph at page 32 of the Plan and the existing Table 2 and insert the following: "An amended closure/post-closure care cost estimate is attached to this Addendum as Exhibit E."

Appendix C - <u>PRECONSTRUCTION ACTIVITY</u>

Add the following at the end of the second paragraph under the heading "Evaluation of Construction Materials": "All data compiled to evaluate design suitability shall be reviewed and approved by NYDEC."

Appendix E: <u>POST CLOSURE GROUND WATER MONITORING PLAN</u>

2.01 <u>WELL LOCATIONS</u>

Delete the last three sentences of the second paragraph at page 3 of the Appendix and insert the following:

"Monitoring well screen lengths will be selected dependent upon site specific geologic conditions noted at each well location. If the aquifer thickness at a given location is determined to be less than 15 feet, a single monitoring well will be installed and screened with a 10 foot section of stainless steel well screen extending from the ground water interface to the top of the till layer. In areas where the aquifer exceeds 15 feet in thickness, a nested pair of wells will be installed consisting of a shallow well screened at the water table interface and a deeper well screened immediately above the aquifer/till interface. These wells will be fitted with 5 foot sections of stainless steel well screen."

2.03 <u>ANALYTICAL REQUIREMENTS</u>

Delete the second last sentence of the paragraph and insert the following: "In addition, during the initial sampling event, one designated upgradient monitoring well and one downgradient compliance monitoring well will be sampled for Appendix IX constituents as identified in 6 NYCRR Part 371."

3.02 <u>SAMPLE PRESERVATION AND SHIPMENT</u>

Add in the second line at page 7 of the Appendix the word "total" between "pollutant" and "metals." Add after the sixth line on the same page the following sentence: "All samples filtered and unfiltered collected for metals analyses will be preserved to a pH of less than 2 in the field."

4.01 <u>GROUND WATER ELEVATION ASSESSMENT</u>

Delete the first sentence of the paragraph at page 9 of the Appendix and insert the following:

"A complete round of ground water elevations will be collected during each sampling event including the accelerated and quarterly sampling events. These data will be reduced to datum and summarized on a data base table."

4.02 <u>GROUND WATER QUALITY ASSESSMENT</u>

Insert as a new second sentence in the first paragraph at page 9 of the Appendix: "The replicate samples will be analyzed for elevated constituent parameters identified by the Appendix IX analyses."

4.03 <u>REPORT SUBMITTALS</u>

Delete the first two lines of the third paragraph at page 10 of the Appendix and insert the following: "An annual report covering all the analytical data obtained to date shall be submitted by March 1 of the following year until a post-closure permit is issued."

<u>MONITORING WELL INSTALLATION PROTOCOL</u> (Post-Closure Groundwater Monitoring - Appendix B)

I. <u>Drilling and Sampling Procedures</u>

Add at the end of the fifth paragraph the following: "The drilling and associated equipment which come into contact with potentially contaminated materials will be cleaned on-site with a portable pressurized steam cleaner."

II. <u>Monitoring Well Completion</u>

Insert following the second paragraph:

"Screen lengths for each monitoring well will have a maximum length of 10 feet, sand packs will consist of an appropriate sized, graded aggregate, (preferably Q-Rock-4). The sand pack will extend a minimum of two feet above the top of the well screen. Subsequent to grouting, an outward sloping concrete apron will be installed around the protective casing to insure that runoff will proceed away from the well head.

All monitoring wells will be developed or cleared of all fine grained materials and sediments that have settled in or around the well during installation to insure the screen is transmitting representative portions of the ground water. The development will be by one of three methods, air surging, pumping, or bailing ground water from the well until it yields relatively sediment-free water. The determination of which method to use is dependent upon the size and depth of well and the volume of ground water in the well.

The air surging method of development consists of extending a clean propylene tube down into the screened portion of the well. This tube is attached to an air compressor. The compressed air displaced the water and suspended fine grained material from the well. The well is allowed to surge until the ground water clears. For either the pumping or bailing method, a decontaminated pump or bailer will be utilized and subsequently decontaminated after each use. Ground water will be pumped from the bottom of the well. Bailing will utilize a stainless steel bailer and new polypropylene rope. Pumping or bailing will cease when the ground water yields sediment-free water."

<u>GROUND WATER SAMPLING PROCEDURES</u> (Post-Closure Groundwater Monitoring - Appendix D)

Add under <u>Materials</u> the following: "17. Bottom loading stainless steel bailer which will be used to collect ground water samples."

Add under <u>Sampling Procedures Using a Bailer</u> the following:

"Notwithstanding anything in this section to the contrary, the following procedures shall be observed:

(a) The total depth of each well will be measured prior to initiating well evacuation.

(b) Bailing will continue until 3 to 5 well volumes have been evacuated and/or pH and specific conductivity measurements exhibit reasonable stability.

(c) Purged water will be containerized and transported to Fisher Guide's on-site wastewater treatment plant for disposal.

(d) Samples for volatile analysis will be collected within 3 hours of evacuation.

(e) A ground water elevation measurement will be taken prior to sampling each well to observe the percent of recovery."

Frank -

Thank you for your help today. I was able to obtain a copy of the SWMU response for GMC - Fisher Guide

If you have any questions please call.

Barb Hendricks

- ask Herb Mulholland

GM FISHER

CP.

new cost estimate - addendum.

PR

Luis -

Talk to Frank about GM Fisher. I haven't been able to get the closure plan. Call Leslie Stephenson + tell her you are the engineer for EPA concerning GM Fisher, + that you'd like a copy of the closure plan. If she does not send it, Frank may want to talk to Steve Kaminski about getting it.

Leslie is also supposed to generate the Preliminary Review (PR) this month. I have reminded her to do so. Frank may also want to talk to Steve K. about this; however, it is not on the workplan for this year. It was supposed to be done last fiscal year, though.

Ellen

Dan Kraft FTS 340-6669
in Environmental Services Division.
Section chief of TSCA Enforcement.

Toxic Substances Control Act (TSCA)
40 CFR. Parts 700 to End.

PCBs

< 50 ppm not regulated
50 - 500
> 500 ppm incineration is preferred

Leslie Stephenson - NYSDEC Engineer

Corrective Action Activities.

Post-closure permit (PCP) recently called-in.

review RFA Guid.

PR to be done in Oct. '88.

VSI to be done in November.

Ask Frank to go on VSI (with NYSDEC)
with Ellen?

References – that should be used in a PR

1) Files permit / inspection reports

2) GW Monitoring Reports → LDF's.

3) 373 Application / Closure Plan

4) SWMU questionaire ←

RECOMMENDATIONS FOR SWMUs.

NO ACTION	RFA-SV	RFA-VSL	RFI

4 different alternatives for action at solid waste mngmnt. units (SWMUs).

Contents of a PR

1) Facility Description, including environmental setting.

2) Each SWMU should have a detailed description.

(1) Unit characteristics
2) Waste " "
3) Pathway of contaminant migration → Air, Groundwater, Surface water, Soil,
4) Release evidence, if any
5) Exposure potential (human health + the envir.) → closest population
6) Recommendations

Leslie Stephenson will call me Fri on GMC response

GMC Fisher → DEC Water has handled this.

280 yds.

Meadowbrook → site where sediments dumped

SPDES Discharge into Ley Creek

illegal discharge of PCBS by GMC Fisher

450 ppm

no Part B

↳ drum only.

CP NOD out.

En for. (DEC)

testing 94 samples @ Meadowbrook

~~##~~ 7 ppm AVG.

1986.

highest level 40 PPM

always pl'nd to close?

Co. Health Dept said baseball field can't be built there

yes.

bringing sediments back to SI's.

10 resid
25 indust } spills

should it be used as fill.

350 ppm
17 ppm.

dirty close
clean to 50 ppm.

clean close → to 10-25 ppm.

Westin
O'Brian + Geer

PR

Hydrologist → Leann Whitbeck

Talked to Leslie Stephenson 12/29/87 11:30 am

GM Fisher sent their revised CP. Good, but...
However -
Didn't characterize sludge.
They state they're cleaning up to 25 ppm
but will use 50 ppm material.

Huh? Leslie going to clear this up.

GMC Meadowbrook soils →

40 ppm soils off-site

DOH → move it.

Put into SI → closing dirty.

clean will up to 25 ppm →

PCB spill-up.

Skully'd

ollo